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The Olympian System
of
Physical and Mental Development

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Part One

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THE OLYMPIAN SYSTEM

"Mens sana in corpore sano"

PART ONE

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The Olympian System of Physical and Mental Development consists of Charts, Instructions, Text Material and Outlines as follows:

THE CHARTS

General Chart for Daily Normal Exercise.

Charts for Men

Spine Flexibility.
Strengthening the Stomach.
Chest and Shoulders.
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Agility and Flexibility.
Advanced Strength Building.

Charts for Women

Back and Spine.
Abdominal and Digestive.
Overcoming Weaknesses of Women.
Arms and Shoulders.
Bust and Chest Development.
Flexibility for Grace and Poise.

Three Charts of Instructions for the above.

TEXT MATERIAL IS GROUPED AS FOLLOWS

PART ONE EXERCISE	Section One—Physical Training. Section Two—Constitutional. Section Three—Exercise for Women. Section Four—Recreation and Athletics.
PART TWO DIET	Section One—Essentials of Nutrition. Section Two—Hygienic Eating and Food Preparation. Section Three—Curative Diet.
PART THREE PHYSICAL FITNESS	Section One—Keeping Young. Section Two—Health Guarantees. Section Three—Dodging Disease. Section Four—The Body Anatomical.
PART FOUR EFFICIENCY	Section One—Improving the Human Race. Section Two—The Body. Section Three—Personal Attractiveness. Section Four—Practical Psychology.

OUTLINES

The Outlines take the place of the instructor or lecturer and are calculated to stimulate an appetite for further information, and rouse the student to follow eagerly and enthusiastically the suggestions and instructions contained in the Olympian System and thus enable him to achieve Physical and Mental Efficiency.

First Month	(a) The Foundations of a Successful Life. (b) Prolonging Our Youth.
Second Month	(a) Necessary Normal Exercise. (b) Correct Diet.
Third Month	(a) Attaining Standards of Perfect Physique. (b) Correct Standards of Beauty.
Fourth Month	(a) The Prevention of Disease. (b) Strengthening Weak Organs.
Fifth Month	(a) Keep Your Ideal Weight. (b) Recreation in Relation to Efficiency.
Sixth Month	(a) Eugenics. (b) Parenthood and Child Training.
Seventh Month	(a) Energy Building and Efficiency. (b) Practical Psychology.
Eighth Month	(a) Character Building. (b) Personality Building.
Ninth Month	(a) Mentality Building. (b) Success Building.

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MAKE YOURSELF A SUCCESS

By BERNARR MACFADDEN

THE purpose of the Olympian System is to help you to make the most of yourself.

Few people realize the best that is in them.

Men and women are born into this world with God-given faculties and capabilities which may be either developed or wasted. These talents and faculties are like so many seeds. Under right conditions of encouragement and training they will grow and flower and bear fruit. Under other conditions, like seeds planted in desert soil, they find growth expansion impossible.

The successful men and women in this world are those who have cultivated their best faculties, who have provided a physical and mental atmosphere in which these may flourish. The failures, the wretched, the unhappy, are those who have allowed their best faculties to go unused, undeveloped, and finally to become atrophied and lost. Indeed, if one does not encourage and bring out those flowering plants which represent his virtues and capabilities, his personality will rapidly be dominated by the choking growth of weeds—the character weeds.

The Olympian System has two fundamental aims.

The first is to show and convince you that if you so desire you can not only find success, but *make yourself a success,* in all that this means.

The second purpose of this system is to show you *how you can* become a success.

Even the best of human beings have many weak points, many faults and flaws. It is not a crime to have these imperfections. It is only a crime to be satisfied with them. Self-improvement consists in eliminating as many of our failings as possible and in building up our faculties where we have been deficient.

But to accomplish any marked improvement, one must commence with an honest self-analysis. Can you be honest with yourself? Can you sit down and analyze your own character, personality and mentality and do it honestly—so as to discover any reasons for your lack of success? What are your weak points? Permit yourself no excuses, no self-pity, no self-indulgence, no pleading of circumstances. Try to make it honest self-analysis. If you are at a loss to know how to proceed with this self-analysis, consider first the factors that make for success, and then apply these considerations to the study of your own make-up.

What makes for success? The fundamental requirements are energy, brains, will-power and personality. If you are lacking in any one of these four general fundamentals, you will have difficulty in attaining your purposes.

Energy is the driving power back of every successful man or woman. It means capacity for work. It also gives one that capacity for concentration that makes for a better quality of work. It has its basis in health and bodily vigor.

You may consider your body as a machine—as a dynamo. It is in part the purpose of this system to enable you to build a state of physical fitness—to keep the human dynamo in such good running order that an unlimited supply of nervous energy may be generated to be used in your work and achievements. First of all you must keep fit.

The other fundamentals of success, brains, will-power and personality are also in a large measure dependent upon the state of your physical health. The dyspeptic is never of sound mind. A disordered liver gives one a disordered disposition. A poisoned blood stream is likely to be manifested through poisoned thoughts. It is only under conditions of pure blood, perfect functioning and strength and steadiness of nerves that one can enjoy a clear head, thinking energy, will-power and personality. An elaborate course in mental and emotional training is included in the Olympian System. It is intended to give you "a sound mind in a sound body."

If you will make an analysis of your own character and personality, you will very quickly discover your weak points. If not, your friend may be persuaded to be honest enough to tell you them. In that way you will ascertain just what features of the Olympian System will be most valuable in your case.

You have two primary aims in life—happiness and success. In the last analysis, however, happiness depends upon success. There is no real happiness in life for the failure.

You may be sure that success is not a matter of luck. It is a matter of fitness, effort and good work well done. No one who makes the most of himself physically, mentally and spiritually, and who then does the best work of which he is capable, can possibly be a failure. If you approach the study of the Olympian System in the proper spirit, determined that you are going to make use of the lessons to be learned in making yourself a better man or woman, then this course will be of priceless value.

The Olympian System has been very carefully prepared with the help of a widely selected list of authorities, each contributing a helpful and often inspirational presentation of some subject upon which he has specialized. No one specialist could have produced a course of this exceptional value.

LIGHT OR HEAVY EXERCISE—WHICH?

By BERNARR MACFADDEN

ONE of the most frequent of all questions bearing on physical training is the following: Is light exercise better than heavy exercise?

Better for whom?

It is this application of the question to the varying needs of different individuals that calls for more or less understanding of the subject of exercise generally. Different types of men and women in varying degrees of strength and development undoubtedly have different requirements. There is no question that one may sometimes fail to get satisfactory results because his method of exercise is not intelligently planned. It is quite possible for one to do himself harm through wrong methods of training, just as he may benefit from right methods. It is, in fact, not often that one does himself any real injury through exercise, but it frequently happens that one fails to improve as well as he might.

Muscular exercise seems such a simple matter that many people do not realize that there is anything to learn about it. They take it for granted that if you use the muscles they will get strong. But there is more to it than that. One should understand some of the basic laws of physical training so that his efforts may be directed effectively. It should be the duty of every man, woman and child to acquire at least a certain amount of information upon what we might term the "first principles" of physical culture so that he can judge of his own requirements in this respect.

It cannot be said arbitrarily in regard to light and heavy forms of exercise that either is better than the other in a general way. It is entirely a question of the relative fitness of each in individual cases.

One of the first rules of exercise is to avoid unnecessary strain. It is true that in striving for extremes of strength it is necessary to tax the muscles practically to the limit of their power each day. But for the ordinary purposes of health and development, it is always best to keep within the limits of ease and comfort in exercise. That is to say, one should not attempt any movements which cannot be executed with comparative ease. Particularly if one is not accustomed to vigorous methods of training should one be careful to avoid overtaxing the muscles and consuming too much nerve-force. There should be no excessive expenditure of energy, for it is really the physiological results of the exercise that are most desired in the average case.

How can one tell whether or not a certain exercise is too violent or too much of a strain? The best test of this is probably found in the sense of trembling or nervous unsteadiness of the muscles following the exertion. If you experience this trembling you may know that your exercise has been too violent for your present degree of development. Fatigue of the muscles, even to the point of a slight ache, may be accomplished by suitable exercise without this sense of trembling being manifested, and in that case you may take it that the exercise has not been too severe.

If you find that your exercise simply has the effect of waking you up, causing a feeling of stimulation and exhilaration, and especially if it makes you feel that you would like to do more of it, then you may know positively that the work is doing you good. But just there is the point at which to stop. Unless you are training for special results in the way of endurance or unusual development, it is best to discontinue your exertions before the feeling of vigor has given place to constitutional fatigue. If you will do this it is utterly impossible for you to over-exert yourself. There is nothing in the world so stimulating to the mind and nerves as the right kind of exercise, and, of course, this means not too much. In the beginning it is often found that a very little exercise will go a long way.

We have just referred to constitutional fatigue. This is a very different thing from the local fatigue of a particular muscle or group of muscles. For instance, you may continue to repeat a certain movement until the muscle or muscle group involved is temporarily fatigued, and this fatigue is manifested in a pronounced aching and weakness of the part. This condition is local and is relieved by a brief rest. In the same way you may produce in sequence a temporary local fatigue of all the different parts of the body and yet without experiencing any marked loss of general bodily energy. In other words, you may still retain your sense of general constitutional strength. If you can do this, it is good physical culture. It is by this policy that muscular development is accomplished without an excessive drain upon the vital resources. But constitutional fatigue, on the other hand, is brought about when one's exertions have been carried to a point at which the general bodily energy or reserve strength seems to have been to some extent used up. It is this exhaustion of the reserves of nerve-force that should be particularly avoided in connection with intelligent physical training.

The unsuitability of heavy or violent exercise to those not accustomed to it is so obvious even to the uninitiated that it is sometimes responsible for a prejudice against physical training generally. Also, because of this prejudice against heavy exercise and the consequent approval and over-valuation of light exercise in other minds, it has even been stated in some instances that light exercises are best for building great strength. From the fact that light exercises are undoubtedly preferred in certain types of cases, however, one must not assume that they are superior for all purposes. The fact is that great strength can be developed not by light exercises, but only by vigorous forms of training involving the expenditure of great strength.

For those in delicate condition and of limited development, it is folly to attempt anything in the way of vigorous exertion. Likewise, for those who are not accustomed to exercise, only light movements should be attempted, even though they are fairly heavy in build and seem in moderately good health. A fleshy condition does not mean muscular vigor, and one should never jump from physical stagnation to extremes of violent effort. One should never make a sudden plunge into vigorous physical training, not only on account of the general effect, but particularly on account of the unaccustomed strain on the heart, blood vessels and internal organs. But especially where the muscles are weak and undeveloped, and the vitality is low, light exercises only should be used. Without doubt many persons go wrong in trying to take a man's size portion of exercise when a baby's dose would be about right.

Under the influence of light calisthentic work unused muscles will be quickly infused with life and will develop rapidly up to a certain point. Lack of exercise is unnatural, and the muscular structures inevitably degenerate under such conditions. But by calling them into daily action with moderate exertion they will quickly respond and acquire the tone and vigor which make for health, and which will prepare them for further progress in the way of development and strength building if one desires to develop a marked degree of strength.

We must remember that the purpose of exercise is not merely muscular. Especially in light exercise it is the physiological result that is most important. First of all it is the effect of exercise upon the circulation that one should consider.

Everyone, in spite of himself, enjoys a certain amount of light muscular activity in the ordinary movements of everyday life, even though he walks only a little. But while the circulation of the blood does not stop, even when a man lives an inactive life, yet it is comparatively stagnant and he cannot possibly enjoy the same condition of bodily vigor and organic strength as his neighbor, whose circulation is kept active and accelerated to an unusual degree at certain times of the day through appropriate special exercise of some kind.

The fact is that exercise not only keeps the muscles in good condition but it keeps every tissue in the body healthy. In those parts of the body subject to movement in the course of one's activity, the very blood vessels themselves undergo a process of stretching and contracting. The nerves are stretched and massaged as it were. The state of tension to which the tendons, ligaments and even the bones are subjected affects their strength and health. In short, exercise has the effect of massaging and stimulating every cell in the body as well as the larger structures.

Moreover, through the improved circulation induced exercise has the effect of cleansing the body internally. Waste material is more perfectly taken up by the bloodstream and eliminated. Worn out, dead cells are eliminated. New cells are built up. Indeed, the unusually active circulation brought about by exercise has the general effect of flushing, so to speak, not only the blood vessels themselves, but all of the bodily tissues.

Aside from these general constitutional results, one should not ignore the direct effect upon the internal organs of all movements which involve bending, stretching, and twisting of the trunk of the body. This organ-strengthening influence of exercise will be given such attention as we proceed with our system that we will not stop to dwell upon it here.

But while it is the constitutional rather than the purely muscular influence of exercise that is most important, it is essential, in order to get even the former result at its best, that the muscles themselves should be properly used. To a large extent the difference between exercise and the ineffectual bodily movements of everyday life is found in the fact that our ordinary activities involve only a limited sphere of movement. We move the hand perhaps a few inches only in doing a certain thing. We move the arms usually a few inches at a time. We move the head a couple of inches. We turn or bend the body no more than is absolutely necessary for accomplishing various purposes, instead of twisting or bending it to the full limit to which our muscular structures make it possible.

In exercise of the right kind, on the other hand, we move the arms not a few inches but as far in every direction as the muscles are capable of carrying them. Again, we bring the head far forward, back and sideways, to the full extent that the action possibilities of our muscles will permit.

Exercise to be effective should embody this principle. In other words, in extension movements one should actually stretch the parts with each repetition of the exercise. In flexing or bending movements the muscles should be contracted to the fullest degree, and the flexing or bending of the part of the body concerned should be carried as far as possible.

The number of repetitions of each exercise will depend upon the condition of the individual. Ordinarily it is sufficient to do each movement ten or twenty times. In some cases each movement might be executed thirty times or more. But when forty or fifty movements are not sufficient to produce local muscular fatigue, you will understand that you are then ready for exercise of a more vigorous character.

It must be understood that in all cases, even for the most powerful athlete, light exercise is of undisputed value by reason of its effect upon the circulation of the blood and the internal organs. For many persons of a light-boned type, light exercises will always be most suitable.

THE NEED FOR VIGOROUS EXERCISE

By BERNARR MACFADDEN

MEN and women enjoy various degrees of strength. Some are strong, some are weak. In the same way there are various standards or degrees of health. And of ill health.

What is your standard?

Is your health vigorous, feeble or indifferent? Are you satisfied with a mere bodily existence, or do you demand a standard of health that implies the possession of a high degree of vital strength, nerve strength and organic strength?

Perhaps the most interesting point about truly vigorous health is that it is invariably associated with muscular strength. The weak-kneed individual who thinks he does not care anything about *strength,* but only wishes to have *health,* does not know what he is talking about. Vigorous health is almost unthinkable without a normal muscular development and the all-around physical energy that goes with it.

There is no such thing as good circulation, proper bodily warmth under all conditions, satisfactory nutrition and all-around health without a muscular system that is normally developed. And this requires a measure of daily exercise that will to some extent test one's strength. Light exercises have a certain value of their own. They are indispensable under certain conditions. They form a foundation for advanced physical training. But for the man who has reached a certain degree of progress in the building up of strength, that is to say, for the man with a normal and vigorous development, light exercise is practically no exercise at all. A person of robust constitution needs real muscular exertion, not only in order to keep the muscular system in good condition, but also in order to wake up his heart, lungs and the internal organs generally. The mild effort involved in light calisthenics will not have sufficient effect upon these organs in the case of a vigorous man or woman.

The time has passed when the "out of bed" standard of strength and health can be acceptable to anyone acquainted with the principles of physical culture and the possibilities of the human system. We can no longer regard the mere capacity to sit up and take nourishment as a condition of true health. And yet the advice offered on the subject of exercise in many quarters is chiefly in the direction of caution lest one should really exert himself. These theories of light exercise only, the fear of exercise, the suggestions on the "careful life" or the "delicate life," are all based on a misunderstanding of our true physical needs. They are the outgrowth of a failure to appreciate the natural vitality and energy of human life.

Not only is activity of a vigorous character natural, but it is practically inevitable and unavoidable in the case of a truly healthy person. He will "go to it" spontaneously, instinctively. When you marvel at the strength and physical power of some of the lower animals, remember that the human animal should be no less full of vitality and stirring energy, and that under normal conditions this energy will put itself in evidence through activity of a strenuous character in one form or another. Remember that such energetic activity will be indulged in because it is natural and because it is enjoyed, and that no harm will come from it because the human system has been adapted to just such a stirring, vigorous, strenuous life through hundreds of thousands of years of it on this earth.

Energetic and concentrated effort of an intellectual character is comparatively new, though even that has become natural to us. But vigorous physical exertion is as old as the hills. Our bodies have been shaped and evolved for it, through all the ages, and it is quite the right kind of activity for one who is properly developed and has nothing the matter with him organically.

Unfortunately, so many of us, for various reasons, are not normal. And among other things, our very civilization tends to induce physical stagnation. Apparently some people think that they secure sufficient exercise in handling a knife and fork, or even in rolling their own cigarettes. What kind of men are we when we fear to undergo exertions that really test our strength, or when we are physically capable of using tools no heavier than those of the manicure artist! Indeed, many of us apparently need assistance in putting on our overcoats.

Do you fully realize the importance of the muscular system in maintaining health? Do you keep in mind the fact that under normal conditions the muscles make up from forty to fifty per cent of the bulk of the body? When you understand that the greater part of our food is consumed in the muscles, and the greater part of our bodily warmth is produced in them, you will commence to see more clearly their importance in maintaining a good circulation. You will also better understand why the person who is lacking in muscular tissue must be below normal in other physiological respects. He cannot possibly be at his best when this vitally essential part of his being is not fully developed, and not sufficiently active to insure a vigorous circulation and a well-balanced state of the bodily functions in general.

Just here is a very good suggestion for the person who complains of cold feet and hands. In some cases a weakened heart action may be partly responsible for this condition. But as a general thing, the lack of circulation is very closely related to deficient muscular development and lack of daily activity.

About how much exercise, then, do we need? The man or woman of low vitality will need only a little, though that little will be needed badly in order to gain strength. But the man or woman with a sound constitution and the capacity for a high degree of energy needs considerable activity in order to maintain real bodily vigor and a large fund of energy.

But the amount of exercise is determined by its intensity or quality of effort, as well as by the time devoted to it. So far as the building of strength is concerned, the intensity or vigorous character of one's activity is far more important than the quantity as indicated in the number of repetitions of some gentle movement.

Let us see. From the standpoint of foot-pounds and energy expenditure, there is no difference between ten repetitions of a five-pound effort and one fifty-pound effort. But as a matter of exercise for strength building, there is a tremendous difference. And it is important that everyone interested in exercise from the standpoint of strength building should understand this.

Strength of muscle is measured by its power to contract against resistance rather than by its ability to repeat a movement against small resistance. A five-pound effort, so to speak, may be quite easy, and after one is able to repeat it ten times, it would perhaps require very slight additional strength to be able to repeat it a hundred times. But it will require ten times as much strength to make the fifty-pound effort as it does to make the five-pound effort.

Now, if one wishes to gain the strength to handle fifty pounds in a certain way, he should not attempt to acquire this by handling five pounds in the same way, no matter how many repetitions of the exercise. It is not repetition but exertion against a greater resistance that will best develop increased power. Otherwise the girl typist would have hands as strong as Arthur Saxon.

For building strength, therefore, one should very slowly increase the amount of resistance to muscular contraction, or gradually adopt exercises of a more vigorous character. It goes without saying that progression in this respect must be made by easy stages. In other words, one should not jump from a five-pound resistance to a fifty-pound effort, but should increase the resistance gradually.

There is a fundamental difference between strength and endurance, though endurance naturally depends to a large extent upon one's strength. However, in the building of a high degree of strength, even one or two movements each day performed against great resistance will accomplish more in promoting muscular bulk and power than prolonged repetition of some easy movement.

This explains why some of the world's famous "strong men" have been fat. Louis Cyr, the Canadian giant, looked like a fat man in spite of the prodigiously powerful muscles concealed by his adipose covering. The reason why fatness may persist in such a case is because it requires very little heavy work to maintain strength of this kind, and one may not indulge in enough activity to consume or burn up the fat. A large amount of light, fast exercise would be more effective in this direction. At that, the fat type of "strong man" is naturally more healthy than the merely fat man who takes no exercise and lacks the strong man's large percentage of healthy muscular tissue.

A very good example of the comparative muscle building value of vigorous and of light exercise is seen in the distinction between fast running, commonly called sprinting, and long distance running. Long distance running is an example of endurance rather than of strength. It requires only a moderate muscular development. Given leg muscles sufficiently developed to be able to trot a couple of blocks, it does not take much more development to enable one to run a couple of miles at the same easy pace. But sprinting requires an enormously more powerful contraction of the driving muscles of the legs. Running at top speed calls for the highest degree of muscular power that can be obtained. Therefore, practice at fast running will develop the leg muscles to a degree impossible to attain by any amount of long distance work. Sprinters are invariably beautifully muscled and vigorous looking specimens of the race.

This does not mean that I advocate fast running in all cases. I simply use this example to illustrate the relation of greater resistance to the development of increased muscular power. In most cases easy long-distance running is more constitutionally healthful and beneficial than sprinting. Remember, however, that even slow running is a form of fairly vigorous exercise.

Granting, then, that vigorous exercise is not only desirable but essential for the normal and well-developed man or woman, the question is, how vigorous? This will depend upon the individual. One should avoid extremes. He should not strain himself. All that is necessary is a degree of real resistance sufficient to test one's strength to a certain extent. It should be sufficient to make one exert himself. The half asleep type of exercise is of no value. Your efforts should be sufficiently energetic to wake you up and to enable you to "feel" your strength.

Probably no type of exercise is more generally satisfactory for complete and symmetrical development than those forms of physical training in which the muscles are concerned with handling, so to speak, the weight of the body itself. Anyone with a normal development should be able to handle his own body in this way easily and freely under all conditions. Indeed, if the question should arise as to what is normal development, it might even be defined as that which enables one to have perfect and easy control of his own person under all conditions.

It is for this reason that gymnastic apparatus work may be recommended. It is not necessary that one should have the use of a modern gymnasium for purposes of physical training, but if one has convenient access to such a gymnasium, the apparatus work will be found ideal, especially for building strength of the upper body. Work on the parallel bars, horizontal bar, flying rings and vaulting horse, giving one the ability to handle the weight of his own body readily under all conditions, is conducive to what we may term normal development. If you find such exercise too strenuous at present, do not attempt it then until you have had sufficient preliminary training with lighter exercise.

By way of vigorous exercise that may still be regarded as healthful and normal, I know of nothing that is better than wrestling. Wrestling is a form of athletic competition. But it is also the most perfect of all forms of physical training for those who are already strong enough to indulge in it. It is a natural exercise. It permits one to indulge his strength to its full limits and yet, if he is properly trained, it does not cause him to over-exert himself, for the reason that his strength is opposed only by the approximately equal strength of his opponent. Wrestling is fascinating because of the element of competition. It is interesting. It calls for quickness of mind. Finally, it is also the ideal exercise for building endurance and strengthening the internal organs. At the same time, no one should attempt such a violent form of recreation unless he has first developed a high degree of all-around bodily vigor.

Perhaps, after all, many persons searching for health will need most to be cautioned on the subject of overdoing their exercise. Enthusiasm will carry many of them too far. I have a letter from an athlete who has mastered the art of chinning the bar with one hand, who asks whether it is better to repeat it as often as possible at one time, with the utmost effort, or to do it a moderate number of times and practice it more frequently. He has found that when he strains the muscles of the arms by chinning to his utmost capacity, he produces a discomfort something like rheumatism. Chinning the bar even with two arms is a truly energetic exercise. If you are able to do it twenty times to make a record, then it would be best to attempt it only fifteen times as a matter of daily practice. Do not tax yourself to the limit in this way.

Another student writes that although he has exercised a great deal, the muscles do not seem to increase in size and strength. Possibly he has given too much time to light exercise. On the other hand, if his exercise has been sufficiently vigorous, it is probable that he already has a full and normal development, considering his build and possibly light bony frame, and that he has no real complaint to make about his physique. You must consider your own particular type of build. Do not be misled by statements as to "what you should weigh," or by tables showing "standard" measurements. You may be "thick-set," with a comparatively heavy bony frame, or you may be naturally slender, and in either case your measurements and weight may be away off from the average shown in the tables, and yet be absolutely normal. The real test lies in bodily energy. Are you nimble, active? Do you feel strong, energetic? Are you full of life? These are the essentials. The so-called "standard" of measurements would perhaps be abnormal in your case.

Remember that if you can handle the weight of your own body easily, quickly, comfortably and freely, under all conditions, your development is normal and satisfactory, even though your measurements may not approach Sandow's.

DEVELOPING THE CHEST

By BERNARR MACFADDEN

THE human chest, the uplifted, expanded human chest, is at once the source and symbol of human power and achievement. It is the link that bolsters and backs up the brain and brawn and saves the human form from the appearance and the reality of being a mere mechanical housing for a thinking machine.

It is these symbols of things of the soul, of emotion and intelligence, that give the spiritual greatness to the art and to the reality of the human form. And these psychological parallels to purely physiological laws are what made man's body more than blood-fed flesh and the human chest more than a container for a pair of lungs.

All the people who have thought at all have recognized that a good chest was a prime necessity for a good man. Artists have found in the human chest a source of beauty and symbolic strength not to be excelled by any other part of the body. Athletes, whether their goal be strength, agility or endurance, have always gloried in a good chest, and chest expansion has long been conceded as the most important indication of physical quality that could be expressed in a single measurement. Even those who have no love for body beauty or athletic achievement have been forced to recognize the chest as the seat of human vitality and essential to all life's strength, whether for the achievement of the muscle or the mind.

Universally conceding its importance, men have long used the terms "weak chests" and "powerful chests." Asked to define a weak chest, most men, even well-informed men, will say that a weak chest is a flat chest. Tuberculosis, the disease of weak lungs, has been supposed to find particularly welcome lodgings with flat-chested hosts. Some years ago Dr. Woods Hutchinson measured the chest index of a number of tuberculous patients, with a view of getting data to prove his theory. Imagine his surprise to find that consumptive chests were not as flat as the general run of the race.

To take the chest index, one measures (at the level of the nipples) the chest diameter from front to back, and from side to side. Suppose the former to be 8.4 inches and the latter 12 inches. Then dividing 8.4 by 12 we get 70 per cent, which is the chest index. If the chest were perfectly round, this chest index would be 100 per cent, and if twice as wide as deep the index would be 50 per cent.

The average human chest index is 70 per cent. But the index of consumptives, as found by Doctor Hutchinson, was nearly 80 per cent, meaning that they had rounder, more barrel-like chests than the average. But on such round chests it was found that the shoulders tend to hang forward and down, and the shoulder blades, instead of lying flat upon the back, tend to slide around to the sides with the edges sticking out like sprouting wings. This gives the consumptive's narrow chest an appearance of being flat when the true chest cavity is just the opposite.

And now comes the interesting part of the story: Animal chests are very deep side to side. It is a fundamental principle of evolution that the infant represents an earlier type in the history of the race; and sure enough, in the unborn babe human embryo we find this same type of deep chest—that is, with an index as high as 115. At birth the shape is almost exactly round, giving an index of 101. The chest now rapidly flattens. The youth in the early 'teens has an index of 80. The woman's chest remains permanently more round, or with a higher index than the man's. Likewise the negro's is also more like the primitive type.

From all this we reason that the consumptive chest is a case of "arrested development" or retained immaturity. The remedy for the individual is more exercise of the same type as that which originally evolved the wide human chest from the deep animal chest.

To have a strong chest is to be a strong man. It is the thing we beat on with our fists when we want to outroar the lion. The breath of life comes and goes with the heaving of our ribs. The strength to grip and grapple and spring and claw and fight are there, superimposed over the bony cage of our ventilating apparatus.

To be weak in either breath or strength means a failure in the end; to be big in both means a completeness of power and beauty and victory.

The flat chest—the sunken chest—the undeveloped chest—are tokens and proof of failure.

Use your chest. Inflate it, expand it, uplift it. Put air in it, put muscles on it. Beat on it, if you will, and roar.

Let there be back of a good chest a good back; and a back is a backbone plus plenty of porterhouse steak, the highest priced tissue on the bill of fare.

The backbone must be curved just right. That's why the little wizened, sure-enough monkey stayed in the trees and chattered while brother man went out and conquered the green earth—for man got an extra kink in his vertebral column that stuck out his ribs at a roomier angle.

Chief among the muscles of the human chest is the pectoralis major, with its point tucked in at the shoulder joint, and spreading in fan-shaped fashion over the upper front of the two halves of the chest. Add a pound of flesh here and both feeling and fact of a man's power and beauty are increased many fold.

Somewhat greater in bulk, but less conspicuous, are the latissimus dorsi muscles on the side and back of the shoulder, which pull the arm down and back. But we do not think of them as chest muscles, for the chest of a man is usually viewed from the front.

Beneath the pectoralis muscles are the serratus magnus or big saw teeth muscles. It is these that give to the well-muscled man the notch-like corrugations on the sides of the chest. These muscles pull the ribs up and the lower part of the shoulder blade down. Co-operating in this good work are the intercostal muscles. Altogether these rib-raising muscles do the chest breathing—the breathing for emergencies and surplus power. This ability to raise the ribs and increase the lung room inside is the source of chest expansion.

True chest expansion can be best measured at the level of the point of the breast bone and below the lumps of the great muscles fore and aft that pull the arms about. Do not confuse this measure of power of the chest with that of shoulder muscles, as one is likely to do if the tape measure is placed close under the arms in taking chest expansion. Strive to make powerful the true chest expansion honestly measured, and then to add to it the further grace and beauty of the pectoralis major and the latissimus dorsi.

The best chest development exercises are those that will develop the muscles on the sides and front of the chest and increase the power for deep breathing. All arm raising movements expand the chest and are helpful in its development. Deep breathing should not be neglected. Ideal movements for the purpose are those given in the chart covering chest exercises.

PERFECT POSTURE SIMPLIFIED

By THOMAS LLOYD SWIFT

DO you carry yourself like a man or a baboon? Do you sit down like a creature with a backbone or like a jelly-fish?

The first characteristic of the human animal is the erect position. But many of us merely hang together, as it were, from the waist up. Instead of standing and walking as though possessed of a spine that extends up to the base of the skull, we simply droop above the waist and get along as best we can without actually tipping over.

The true erect attitude is the position of vigor and energy. It indicates that one is thoroughly alive. The drooping, hanging, sloppy attitude is the attitude of weakness, of laziness, and lack of character. Also, it is unfavorable to the best functioning of the vital organs.

The first thing a soldier learns is to stand up. This is because those in charge of military affairs demand efficiency and energy in the men engaged in this branch of public service. The world has not yet realized that the same degree of physical energy and efficiency are needed in the affairs of civil life. However, the soldier is not trained to stand erect merely for the sake of the physical or physiological advantage, but also for the sake of the mental and moral associations of such a posture.

Almost everyone realizes, though sometimes only in a vague way, the need for improved posture. When we were children we were told to "stand up straight," to "sit up," and "hold your shoulders back." And parents today say the same thing to their children. There is the incessant effort to improve posture but usually without knowing how. The mere effort to hold the shoulders back to prevent round shoulders is fruitless. The secret of good posture lies in straightening the upper spine.

It is for this reason that Bernarr Macfadden's method of upper spinal exercise, which he calls "vitolysing," is a simplified solution of the entire problem of securing good posture. It is this cervical spine, consisting of the seven uppermost vertebrae, that in the case of most people is most seriously bent out of shape through faulty carriage. Mr. Macfadden holds that this simple form of exercise for this part of the spine not only tends to straighten and strengthen the mechanically wonderful structure encasing the spinal cord, but that it is favorable to increased vigor and activity of the central nervous system—a sort of mental and nervous stimulant. This is only natural. The importance of a normal spine has been so thoroughly demonstrated not only by osteopaths and chiropractors, but by many others, that nothing needs to be said upon that subject here. But good posture is such an important factor in keeping the spine normal that the value of vitolysing in this connection cannot be given too much emphasis.

To attempt to pull the shoulders back and hold them back in the endeavor to gain good posture, while somewhat commendable, is more or less futile so long as the central and basic structure of the body is ignored. The backbone is the fundamental and dominating structure of all vertebrate creatures. The limbs, together with those structures which we call shoulders and hips, are merely built out from the spine, as are also the ribs for encasing the most vital of our organs.

To make a real improvement in posture, therefore, it is essential that this central supporting pillar of the body should be straightened out in a normal manner. As a matter of fact, the moment the upper spine is straightened up through the practice of vitolysing, the chest is automatically raised to its normal elevation and the shoulders take their proper position naturally. You do not need to think of expanding your chest or pulling your shoulders back if only you straighten your upper spine. Following this, all of the rest of the body will naturally assume its normal position.

Vitolysing consists in the simple exercise or movement of drawing the head backwards in such a manner as to straighten the neck. This is not done by throwing the face upward and tipping the head back, for that may be done by simply using the axis or second cervical vertebrae as a pivot, and without materially affecting the vertebrae directly beneath it. To accomplish true straightening of the cervical spine, the face must not be thrown upward, but the chin must be kept down and pulled backward or inward. That is about all that you need to remember, simply pulling the chin as far backward or inward as you can without raising it. This is vitolysing. You can do it while looking straight ahead, or you can vary it by turning the head first to one side, then to the other, pulling the chin backward while keeping it down. In turning the head, it will be seen that the chin is simply drawn backward, first over one shoulder and then over the other. It is simplicity itself.

Now if you will try this little exercise you will find that it does not merely affect the neck, but the carriage of the entire body. You will find that the chest is automatically raised to its normal position, that the abdomen is raised and drawn inward and that the curve of the small of the back is slightly exaggerated. This is the normal dorsal curve. You will find, in short, that vitolysing will at once give you the bearing of a soldier. It is a "setting up" proposition. To put it another way, when the soldier is taught to stand correctly, straightening himself up, drawing his head back, he is virtually taught what Mr. Macfadden tells you to do in this simple little exercise. But all that you need to think of is your chin. Keep that down. Pull it far back. This means, of course, that your head will be drawn back with it, involving the straightening of the neck and upper spine.

I have just mentioned the effect upon the arch of the back. There are some curious misconceptions on this subject in the popular mind, probably due largely to such unfortunate terminology as a "straight back" and what is often called "sway back."

You need not be afraid to accentuate the arch of the back or dorsal curve.

This curve is a natural and inevitable accompaniment of our erect position. If you go down on your hands and knees, thus dropping back to the original quadruped position, the curve in the back practically disappears, but when you raise the upper body to the erect position there must inevitably be the bend in the spine which we find in the normal dorsal curve. The reason for this is the fact that the hips are not so placed or constructed in relation to the spine that the backbone and legs are strictly on a straight line with each other. The hips are so placed upon the lower end of the backbone that the sacrum and lumbar spine instead of extending vertically upwards incline forward at a slight angle. This angle varies somewhat in different individuals. An erect position of the upper body then naturally involves a bending of the spine above this point in order to secure the erect human posture. The more perfectly erect the position the more marked is this curve. It is perfectly natural. The other two curves, the lumbar and cervical, are likewise incidental to the erect posture. There is, therefore, no such thing as a "straight spine," speaking literally. The term is only used to differentiate a good posture from the stoop-shouldered attitude.

And yet, even writers on the subject of good posture sometimes express a needless conservatism in regard to doing the very thing that will give one a truly erect attitude. Much is said in discussions of this subject about the "straight line position." The straight line in question is an imaginary line upon which good posture is supposed to be founded. In many cases it is only confusing to attempt to approximate this imaginary straight and vertical line. If one will straighten the upper spine and accept the natural accentuation of the curve of the back, he will not need to worry about this straight line position. His posture will be perfect without any further thought about the matter. In attempting to secure the straight line position one gathers the idea that he should stand up straight, but not too straight. He feels that he must not exaggerate the curve of the back, and yet it is just this slight exaggeration that gives the soldier his true military bearing—which is at the same time the ideal carriage of vigorous manhood and womanhood under other conditions of life.

The minute you mention the curve of the back, someone is almost sure to warn you against a certain bug-a-boo known as "sway back." If we were talking about horses, mules, or other beasts of burden that had been injured from the carrying of excessively heavy loads, we might have justification in using the term. But no physical culturist need ever have any fear of such a condition. If the term is sometimes applied to one possessing a marked dorsal curve, the term is only bestowed arbitrarily. It does not necessarily mean a condition of weakness. A weak back is not ordinarily manifested in this way, but rather through the bent or stoop-shouldered attitude. The curve of the back, as we have already said, varies with individuals. The women of Spain, for instance, are noted for the distinct character of this curve. It is really determined, however, not by the condition of strength or weakness of the back, but by the relative angle at which the bony framework of the hips is attached to the sacrum or lower end of the general structure known as the backbone. If there is a considerable forward inclination of the sacrum, then the curve of the back will naturally be more marked when the person stands erect.

The best way to secure good sitting posture is by vitolysing. If you are writing at a desk, instead of bending over, try vitolysing to straighten you up and then lean forward from the hips instead of curving over the desk.

Again, when sitting back in a chair, even if it is as badly made as practically all chairs are, the best way to secure a healthful position—under the circumstances—is by vitolysing. Get your upper spine straight and the entire trunk of the body will be improved accordingly.

Bad posture is not only antagonistic to the welfare of the spinal cord, and, therefore, to the nervous system as a whole, but it means a cramped chest. It means a lack of room for the free action of the heart and lungs. It also means a crowding downward of the stomach, liver, spleen and other functional organs. This is accompanied by a protrusion of the abdominal region. Downward pressure of this kind is bound to interfere with the functions of all these organs and it is particularly detrimental in the case of women. It is true that women, as a general thing, preserve erect posture more satisfactorily than men through the artificial bracing of the body brought about by the corset. On the other hand, the beneficial effect of the erect position thus secured in the case of women is offset or more than offset by the constriction of the body and the pressure upon the internal organs. Even when there is no marked constriction of the waist line, as in recent styles, the "straight front" corset produces such direct pressure upon the abdominal region as to be equally detrimental.

The psychology of good posture, however, should not be overlooked. We have already mentioned this in connection with the bearing of the soldier. The erect position is the attitude of dignity, of self-respect, of confidence and of courage. One does not need to be a psychologist or scientist to understand the significance of the hanging head, or the suggestion of spirit and energy conveyed when the head is held erect. The man who has been accustomed to going about with a "hang-dog" attitude will find that he will think better of himself the very instant that he has learned to stand up like a man.

The value of good posture and the value of vitolysing as a means of securing it cannot be over-estimated for this very reason. There is sound psychology in all this, and the mere formation of the habit of carrying oneself in this erect attitude will help one tremendously in the building of character.

WHAT CROOKED SPINES DO TO GOOD HEALTH

By Dr. EDWIN F. BOWERS

AWAY back in that ancient day, when mankind commenced to part its hair from its eyebrows and give its forehead a chance to come out into the open, those who took time to think noted that they were fearfully made. The more they thought about it the more fearfully made and intricate they knew they were. And no one—least of all a physician—would exhibit flustered agitation in admitting that the body is an extraordinarily perfect machine—automatic, self-regulating, self-adjusting, and even self-restorative—up to a certain point. In fact, thousands of medical men have sung eulogies and chanted pæans in extolling the perfection of this marvelous machine—used for a season by the spirit.

And yet, only within the memory of those still living has the idea gained ground that if this body is a machine, its functioning and nutrition may proceed upon a basis of mechanics, as well as of chemistry:

That every one of the three hundred and ten movements known to the science of mechanics having its counterpart in the anatomical architecture, and every known principle and device its prototype, maladjustment and improper relation of these parts one to the other must be uncommonly common:

That among all these levers, bars, wedges, pulleys, joints, pipes, pumps, eccentrics, wheels and axles, spirals, beams, trusses, girders, ball-and-socket joints, arches, columns, buffers, cables, and supports, the strain and stress of life must frequently develop mechanical trouble:

And that this mechanical trouble must affect the smooth running of the engine—just as would mechanical trouble affect the running of any engine.

Of course there are many thousands of physicians who do not yet see why falls, blows, jars, strains, wrenches, and the contraction of muscles and ligaments from improper posture, exposure to dampness or cold, or because of excessive fatigue or over-exertion, should cause any maladjustment that couldn't be securely and satisfactorily mended with a pill.

But their number is gradually growing less. And the number of their former patients, who have been convinced by experience that eggs can be made to stand on end, and that a machine that goes wrong becomes structurally defective, is rapidly growing greater. All of which brings us to the consideration of what crooked spines do to good health.

This subject introduced itself to my notice about seven years ago in the guise of an experience. I, who had never had a pain or an illness worth mentioning—excepting for a triple portion of toothache and all the dental horror that accompanies tooth trouble—developed "rheumatism." This localized in the right hip, from which it was diffused pretty generally over the back, and while not severe it was most persistent and aggravating.

I attended to that miserable rheumatism generously and whole-heartedly. I gave it nitric acid, salicylates, and everything to drink or eat that I or any of my medical friends could think of. I treated it also with vapor and hot-air baths (and they were baking hot), electricity in several forms, phylaccogen, vaccines, and other hypodermic injections, massage, passive motion, vibration and physical therapy, and homeopathy.

I spent weary weeks in the dentist's chair. I sought high and low for hidden sources of infection in sinuses, tonsils, or other lurking places for germs. I tried more different varieties of diet—based upon more different theories of the pathology of acidosis and the rheumatic diathesis—than I ever before had heard of.

In short, I tried about every accredited form of treatment that promised relief from this nagging, obstinate devil that was riding me into a condition of chronic irritability. I didn't try psychic suggestion because I knew from experience with scores of cases that the subconscious mind can only influence functional troubles, or else pathological troubles that have a basis in a neurosis.

This was my condition, persistent more than a year, when I encountered a friend at a medical meeting in Boston. This man, a well-educated and thoroughly conscientious physician, had given up the practice of medicine, and had taken a course in osteopathy. He still wrote prescriptions occasionally, as he thought they were needed, but most of his work was manipulative.

I listened with ill-concealed scorn and pity to his raptures about the results he was getting, and had I not known him to be honest and trustworthy, I should unhesitatingly have said that he was a stout, bald-headed fanatic, and that what he needed most of all, and immediately, was a guardian to steer him clear of a writ of lunatico de inquirendo. I was that obtuse and ignorant, you see.

Anyhow, I stopped over in Springfield on my way home. My friend put me on the table and poked his inquisitive fingers among the joints of my spine. If I had had abscesses distributed between four or five of them, the poked places couldn't have yielded up more pain and tenderness to the square inch. Then the doctor stretched me out and measured the length of my legs. After which he handed down the decision—it wasn't an opinion—that my right leg was three-quarters of an inch shorter than the left. I sat up and corroborated this fact for myself. The acute tenderness on the spinous processes didn't need corroboration. I admitted the fact of their presence without compulsion.

My friend then announced that I had a "subluxation of the sacroilliac joint," which, translated, meant that the head of the right thigh-bone was rotated slightly backward in the socket of the hip—putting the nerves, ligaments and muscles involved on a constant tension—and that the spine was curved to one side below, as well as above, in order to accommodate itself to the disturbed equilibrium caused by the shortened leg. Also that the "rheumatism" was the result of the "pinching off" of the nerve and blood supply. This in turn was caused by the pressure exerted by the spinal vertebrae, because of their abnormal position with relation to the vertebrae above and below them.

The exciting cause of the condition, my friend concluded, was my practice of blithely and impulsively stepping from a street car or a train before waiting for the jinrikisha to come to a stop. All of which seemed very reasonable and sensible. And anyway, seeing was believing.

So the doctor proceeded to make my lower limbs mates. He grasped the recalcitrant leg, and swung it around for a few minutes in arcs and circles, to limber up the ligaments and muscles concerned in this nefarious shortening. Then he gave the member one grand final backward thrust, and jerked it forward in a tremendously potent extension. He repeated this extension maneuver once or twice, and then compared the legs. They were now exactly the same length.

He then twisted and turned my spine, and snapped the deviated vertebrae into their proper alignment. Almost immediately the areas alongside the spinous processes hitherto so tender under pressure "cleared up." Two more treatments, at intervals of a few days, put that thigh bone and the spinal vertebrae into their proper places—to stay.

And now, after a lapse of six years, I have had no return of the rheumatism. I now refrain, however, from "hopping off" cars and moving vehicles, even though I do occasionally lose a few valued seconds thereby.

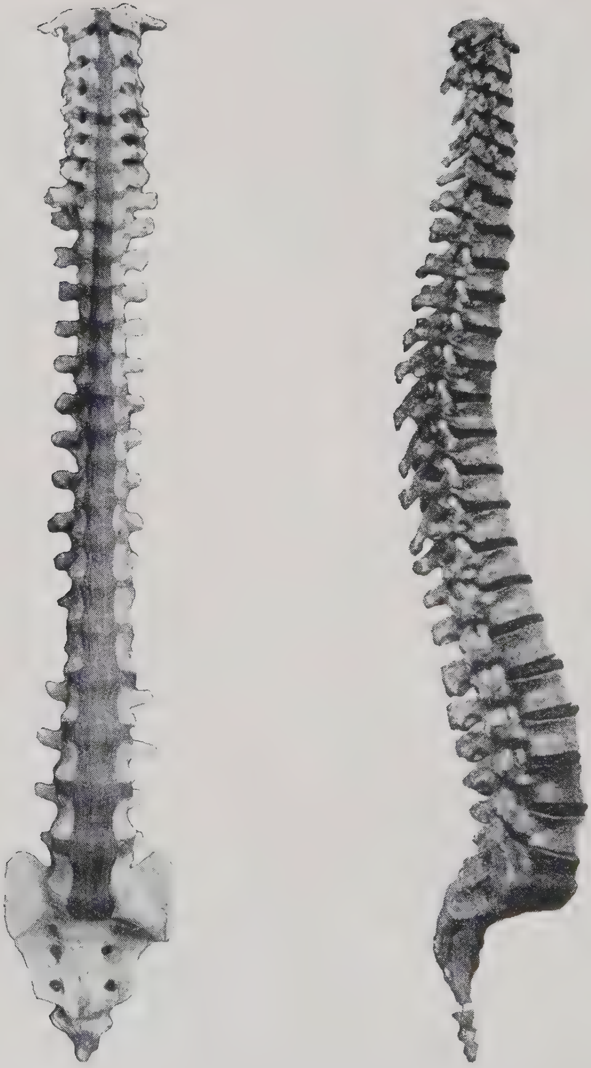
Since that time I have made a fairly comprehensive study of the philosophy of the mechanical causes of disease, and of the various theories involved, and while I think it foolish to claim, as do many well-meaning osteopaths, that all diseases have their original cause in some mechanical interference with the nerve or blood supply, yet the number of such conditions is undeniably great—much more so than medical men might imagine.

In making these egregious claims, however, the osteopath is not unique. We have oculists who profess to cure practically all diseases to which frail humanity is liable by fitting on a pair of glasses, or by dividing a too rigid eye muscle! gynecologists who vehemently maintain that if the patient is a woman her treatment properly falls within their province; nerve men, who can't possibly see anything except nerves; orthopedists who adjust a patient's equilibrium to his shoes and cure him of whatever ails him, from locomotor ataxia to warts on the knuckles; dietitians who relieve intermittent hearts and varicose veins by regulating the character and quantity of the food; and so on through the entire list of specialties.

Those of us who try to take a large view of the human body as it becomes interesting to doctors know that green apples, infection, lack of exercise, bad air, too little drinking water, too much food, constipation, bunions, mouth-breathing, crowded teeth, decaying teeth, and ten thousand other causes may and do produce disease. And this does not in the slightest detract from slipped vertebrae and ribs or maladjusted joints as causative factors in organic disorders—some of which may be most remote and apparently unrelated to the original source of the trouble.

Now, while any hinge or joint in the entire bony framework is liable to displacement to a greater or less extent, the slips and lesions occur with greatest frequency among the thirty-three bones (with their intervening cushions of cartilage) that form the spinal column. The slightest "rotation" in any one of these bones may be fraught with serious consequences, owing

The human "backbone" or spinal column is the central and foundational structure of the entire body. Other structures are but appendages of the spine. It should be kept erect, strong and flexible.



The human spinal column. If the spinal bones or vertebrae are out of line it means pressure upon the spinal cord and spinal nerves, with derangement of the parts of the body controlled by those nerves. Posterior view at the left. The figure to the right gives the side view of the spine showing the cushions or cartilages between the vertebrae.

to the fact that every organ in the body derives its vitality through nerve centers in the spinal cord.

The nerve connections exit from the vertebrae and the ribs exactly where these bones hinge upon each other. Thirty-two pairs of nerves pass out from the spinal cord through the little bony grooves fitted for them by the struggles of the organism to adjust itself to changing environment. These grooves connect with the ganglia of the sympathetic nervous system—the system that controls digestion, nutrition, and all the other functions of the body that work while we sleep, and at all other times. These little knots of nervous matter lie immediately over the hinges of the ribs and their vertebrae.

Consequently, every twist of a vertebra upon its neighbor, every slip of a rib upon its backbone attachment, every contraction of a ligament or inflammation or congestion of a spinal muscle, must necessarily result in squeezing or "impinging" upon the delicate nerve filaments, and, because of irritation produced by pressure, disturb their function. Even such an apparently trivial cause as a "kink" in the muscles of the back may draw muscles or ligaments with sufficient tension to irritate the spinal nerves and their connecting nerve fibres.

Now, one of the duties of certain of these nerve fibres (the vasomotors) is to regulate, by dilation and contraction, the size of the blood vessels, and consequently the amount of blood supplied to the various organs with which it has direct connections. Therefore, when the normal function of the nerves is interrupted by a bone-squeezing pressure—caused by these faults, rotations, "springs," slips, dislocations, or what-not—the tendency is for the area fed by their particular nerve supply to become abnormal—perhaps anemic, perhaps congested. In any event, the vitality of the organ is affected, its function and its normal nutrition decidedly interfered with. This interference, in turn, is transmitted by the organ ultimately affected back to the nerve ganglion from which the trouble originated, further increasing the ire of that irascible little bunch of nerves.

For instance, if there is any mechanical interference in the nerve centers that control the stomach, that worthy and much abused organ will retaliate by refusing to secrete its proper amount of digestive fluids. It will also refuse to churn the food and digest the pabulum—perhaps too generously presented to it. When fermentation and pain develop, as they undoubtedly will, the stomach telegraphs the bad news back to local headquarters in the ganglia of the spinal column, and headquarters promptly responds by becoming very "sore," as does also the pathway of nerves that lead into the ganglion headquarters.

And so the osteopaths claim—and my experience seems to bear this out—that these sore spots on either side of our spines may be mechanical blockades to nutrition. Also that they are indications of trouble in the organ or organs to which the ganglia located in these spots are central nerve-distributing stations, and that by correcting the lesion both the sore spot and the organ it is "sore" about can be cured at one fell swoop.

Therefore there is justification for the osteopathic claim that to enjoy health one must have a free and uninterrupted nerve connection, so as to distribute vital force to all the cells of the body. Also, that a free, unimpeded blood and lymph supply must be provided if we would properly nourish the body cells and remove their débris for elimination.

So a normal back should not be crooked. From a direct back view the spinal line should be straight. Yet the backbone must curve. It must curve four times if it is to be considered normal. For these curves are necessary to balance up and give the proper "spinal axis," as well as to allow proper poise and elasticity. If you haven't these normal curves, you have a "straight spine," which is quite as bad, from a health standpoint, as a crooked one. Both varieties need skilled attention.

Yet stiff painful backs are frequently due merely to a muscular contraction and to the squeezing down of these muscles and ligaments upon the irritated nerves. I have found that a thorough kneading and a firm stroking of the entire spinal column—from neck to tail—especially if a liberal amount of olive oil be rubbed in at the same time—will do wonders in relieving this muscular tension, and with it the nervousness, irritability, insomnia, headaches, and various other conditions that have their origin in this "nerve pinching."

I am also convinced that much can be done—provided there is no actual displacement of the axis or atlas, or of the cervical vertebrae, which may require mechanical adjustment—by the neck stretching and spine straightening exercises given in this system.

The mechanics of this method are sound. And the invigorating effects upon the circulation and on the musculature involved in the exercise decidedly beneficial.

BACK BUILDING CHAIRS

By CARL EASTON WILLIAMS

WHY do we slump in our seats? We have been told ever since early childhood to "sit up straight." We have been warned about spinal curvature, cramped organs and other evils growing out of faulty position, and yet when we settle down in a chair we come as near to lying down on it as the shape of the thing will permit. Why? Should we follow instinct or instruction in this matter? Should we continuously brace up and keep erect, preserving the military attitude in the sitting position, or should we simply rest lazily and carelessly in our chairs and save energy? Should we "sit up" or sit down?

What is the natural sitting position? Let's take a look at the natural man—the savage. He sits on the ground in a position that the "good posture" expert would declare highly improper and unhygienic, with his back all humped over in one unbeautiful curve from the lumbar spine to the back of his neck. And the hired man on a Dakota farm, coming in from a hard day's work in the field, sits down on the bench by the kitchen door with the same identical curve on his back. He is tired and he simply sits down "loose." He wants relief from the strain and effort of holding himself up. And that's what we all sit down for.

And yet what the hygienists tell us about good posture is all true. Of course it is. An erect position is favorable to the spine and nervous system, gives room in the chest and prevents the displacement or sagging of the vital organs. Absolutely true—and important. But there is another factor that is even more vital.

Why do we lazily try to sit down on the "small of the back"? Well, why do we sit at all? There's the answer. For the same reason that we lie down. It is relaxation. We want fatigue freedom, relief from muscular tension. And where hours of time are involved, that means a great deal. For the sedentary, seated worker, is the rigidly erect attitude recommended by the expert to be expected? Is it even advisable? Can one work all day in such a position advantageously? Of course not. It is a waste of energy, a tax on one's strength, a perfect fatigue producer. If we sit down to rest, why not rest?

The real trouble is with our chairs. It is absurd to tell people how to sit properly when their seats will not permit it. You can't sit right in a seat that is wrong. But that is just what the wise ones used to tell you to do. The fact is that an intelligently made chair, fit for human occupation, is a thing unknown. Where is our inventive ingenuity? We construct airplanes, submarines, railroads, engines, skyscrapers, phonographs and "wireless" apparatus. But we have not yet made a comfortable, sensible or scientific chair for general use. Perhaps this is because a chair is a common, everyday article.

The conventional chair is a physiological outrage. If you are the ordinary adult male you instinctively try when sitting down to make your chair more comfortable by tilting it back, balancing on the hind legs. Like a flash your wife speaks up and tells you to bring that chair back to all fours and sit up decently. See what you did to the wall plaster? Or you'll hurt yourself going over backward. But your instinct was right. If you are alone, the chances are that you will put your feet on the table. Bad manners but good hygiene. It rests the heart, saves energy.

Another impulse for comfort is to turn the chair around, straddle the seat and sit facing the back. You fold your arms over the back and lean forward on it—very comfy. Again wifey corrects you: "Turn around, sit up properly and be respectable." Especially in company. But again your instincts are right and she is wrong. As a matter of fact, this is about the only really healthful and at the same time comfortable position in which to sit on an ordinary chair. The chair back makes a splendid chest rest. The chest is raised, and the position of the back is ideal.

In your search for comfort, the next thing you do is to capture the rocking chair. That's a little better. But because you find it comfortable you promptly insist that mother shall have it, or wifey herself. And then you wait until you can get back to your desk at the office next day, where you can tip back and relax. Of course some one tells you to take the "easy chair," but the miserable thing is anything but easy, even with its arms, and you can only make it easy by tilting it back.

Now, every chair should be an easy chair. A seat is intended, first, last and always, to be an instrument of comfort. That's why they put the back on. Honest it is. But see how they bungled the job! Your seat should not be the means of causing physical strain and fatigue. It is true that you can sit in a military position, head up, chest active, stomach drawn in, on a bench, log, stump or anything else. If you expected to do that, it wouldn't matter how your chair was made. But the right chair should afford the maximum relaxation, and with this should be combined a healthful position. Rest—the saving of energy—should be the keynote. And at the same time the body should not be cramped, nor any of the organs crowded. Such a combined result is easily accomplished, but the chair should be properly tailored for the purpose.

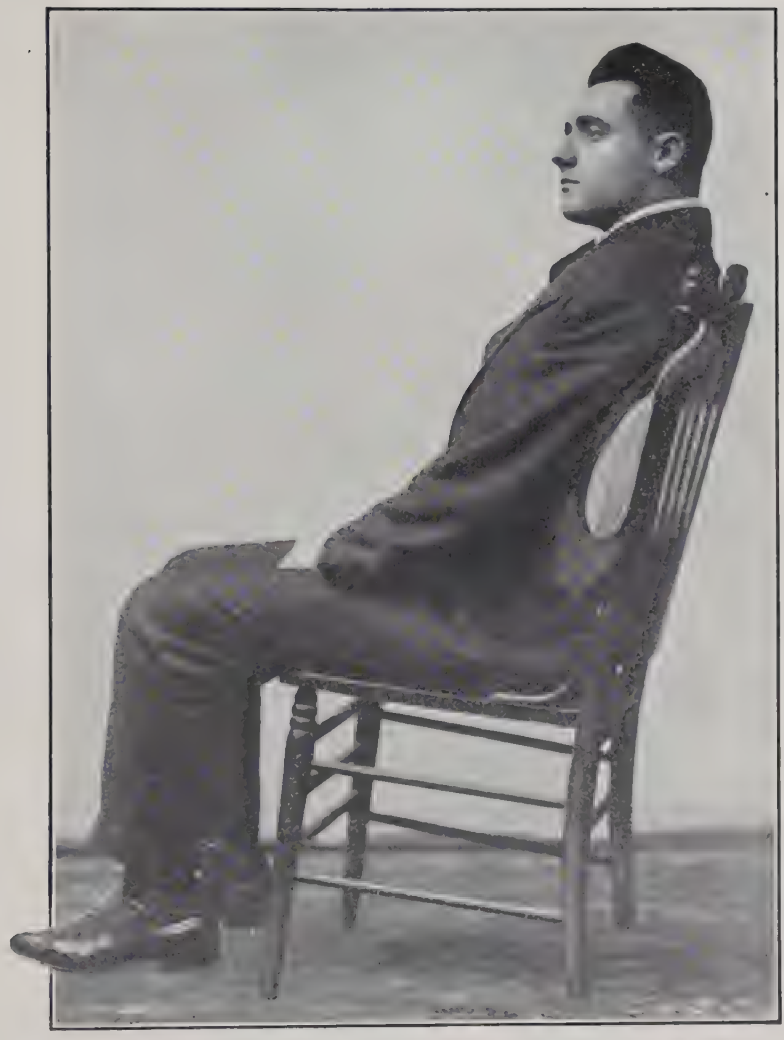
The first thing wrong with the ordinary chair is the level seat. This is very proper on a bench or piano stool, but on a chair with a slanting back the level seat only makes a very good sliding cellar door. If you lean against the back of the ordinary dining chair you can only save yourself from the toboggan slide by bracing your feet against the floor. At that you are likely to coast down half way across the seat. And that's why you seem to try to sit down on the middle of your back; you simply hang from the points of support at hips and shoulders. No chair can be satisfactory so long as one is in perpetual danger of avalanching out of it unless he keeps at least one of his feet on duty in front pushing the floor away.

In order to secure a chair that one can tolerate, we will have to go back to first principles of comfort, as found in the tilting back of the chair, or in the inclined seat of the rocker. It is true that some seats are made with a very slight incline, lower behind, but this is not enough. The incline should be sufficiently marked to allow one to relax utterly without experiencing any tendency to slip forward. In other words, it should be at least equivalent to that of a comfortable rocking chair. If you will slip a thickness of two or three books, or two or three inches of boards or blocks under the front legs of any chair, it will be very satisfactory, so far as the incline of the seat is concerned.

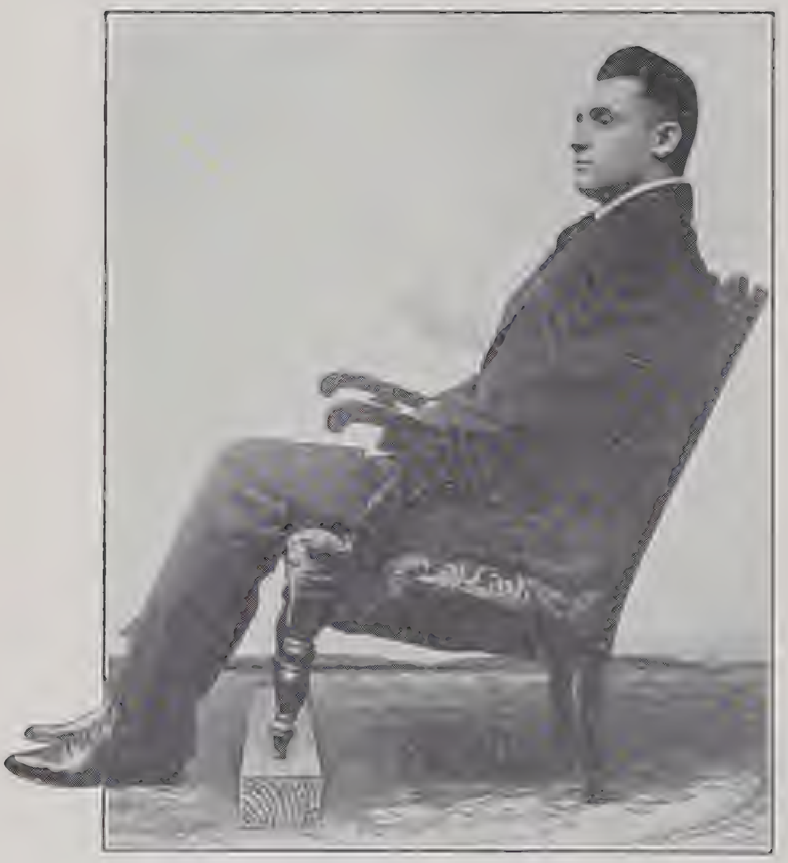
But the usual chair back is even worse than the seat, for the point of contact and support is too high, being at the worst possible place. Properly, the chair should fit into the small of the back, giving support at that point. The suggestion by Bernarr Macfadden, years ago, to use a chair with a short, straight back, reaching only slightly above the waist line, was excellent. Also the suggestion to tie a sofa cushion to the back of the chair, about eight or ten inches above the seat, to afford support at this point, fills all practical requirements beautifully, so far as the back is concerned.

A chair back design which extends straight upward for eight or ten inches, and then curves back to a considerable angle, combined with the inclined seat already mentioned, should enable one to relax comfortably and yet keep the trunk of the body in the most helpful position. If you have also a foot stool (not a table, necessarily) to go with this, you will find all of your energy available for purposes other than maintaining a vertical position or pumping blood up several feet. This matter of saving energy through comfort and relaxation in sitting is a subject to which our "efficiency" experts or engineers will some day give attention, not only in connection with office and factory work, but even in department stores.

There seems to be a prejudice against rocking chairs —in theory rather than in practice—perhaps harking



Showing how a chair of ordinary design may be made to "fit the back." One or two inches are first sawed off of the back legs to give the satisfactory incline so that one may sit far back without straining to do so. Also a cushion, suspended at the small of the back, gives the desired support at this point.



A simple method of making an easy chair easier. The horizontal seat is given a backward slant by the simple process of placing the front legs upon a support. If a cushion is also provided to fit the small of the back, such a chair will be both restful and hygienic.

back to the Puritanical notion that anything pleasant or comfortable must be iniquitous. But the rocker is, on the whole, a thing to be cultivated. It is often badly balanced, pitching too far forward when rocking, and standing too straight when still. If it is inclined to throw you out when rocking forward, so that you must brace your feet on the floor, it is a badly made rocker. But when balanced fairly well back, give me the rocker. The back is at fault, of course, the same as other chairs, but this can be remedied with a cushion as suggested. Rock as much as you like. Never mind the kill-joy who tells you that rocking makes you restless, or consumes energy. And don't notice the injunction of the pseudo-hygienist who tells you that rocking the baby will make it an idiot or lunatic. The rhythm of the rocker does you good if you enjoy it. Follow your natural instincts in this. If it gives pleasure, then be sure that it is beneficial in one way or another, just as is swinging.

The Morris chair, or reclining chair, supposed to offer the maximum of comfort, does have a definite value because you can relax in it, and can more nearly lie down than in any other style of chair. But the back, cushioned as it is, has the same fault as any other chair. You usually hang between the middle of the seat and the back. It is important in any kind of a seat that the hips should sit well back. But because of the usual dimensions of the reclining chair, at least in the length of seat, it only fits those who are well over six feet in standing height, who naturally enjoy longitude between knee and hip. Also, the seat is frequently level.

Naturally one cannot appreciate the importance of these considerations without understanding the relationship between good bodily position and the normal curves of the spine. Unfortunately the whole subject of good posture has been much confused through the frequent references to the supposed advantage of the "straight spine." It seems ignorantly to be assumed that an erect attitude means a straight spine, ignoring the evident curves of the human backbone. These curves are not accidental, but the natural result of evolutionary changes, and they have a simple mechanical explanation.

The straight spine is the piscatorial and quadrupedal form. Even the backbone of the ape is not curved like that of man, being more nearly quadrupedal. And that's why the ape cannot stand entirely erect. The erect position was a later development, and required a bend in the back to get it. This bend, producing the familiar lumbar curve, is due to the fact that when standing erect the legs do not extend in a straight line from the pelvic structure, but are attached at an angle at the hip joint. Or, to put it in another way, the pelvic structure does not extend straight upward following the line of the legs, but slants forward. Of course the sacrum, or base of the spine, is wedged in between the hip bones, at the back, and likewise runs forward here. When on hands and knees, a quadrupedal position, we may attain an approximately straight condition of the lumbar spine, but when rearing up to the erect, human attitude we must bend at this point, hence the lumbar curve.

The new-born baby is more ape than man in some respects, and the spine is approximately straight. So far as the pelvic structure is concerned, the infant at birth is practically a quadruped. Lay him on his back, and his legs stick up in the air, doubled up in the manner that fond mammas think so cute and baby-like. It is simply quadruped-like. The reason is that the natural angle at which the legs are jointed to the pelvic structure is approximately a right angle. As the baby grows this angle becomes greater and he is more likely to extend his legs in a straight line with the body when at rest. By the time he is ready to stand and walk the pelvic bones have acquired the human form and the curves in his backbone begin to appear.

From all of which it will be seen that we cannot expect to have a straight back, and that in attaining a good erect position, such as is conducive to a high, full condition of the chest, we must expect a pronounced arching of the back in this lumbar region. Instead of striving for a straight back, one should if anything accentuate this arch. Some writers, lacking any acquaintance with anatomy, have said that this arching of the back causes the abdomen to protrude, but just the reverse is true. The fact is that the chest is raised, the digestive organs are drawn upward from a sagging to a normal position, and the abdomen is retracted. You can see it clearly in the pronounced military position. The extreme military attitude is not required, but an approach to it in the standing position is desired.

What to do when sitting on a bench? Or when there is no chair back? Then at least, most experts will say, it is important to sit erect. Perhaps. But it is still a question as to whether the cost in energy involved in so doing is not even worse than the effect of crowding the organs through the humped-over but relaxed position. Yet when engaged in some active, concentrated work you will certainly have better application and control by sitting erect. The best way to do it is by sitting well forward on the seat, with one foot under it and the other thrust out forward, keeping your head up, and maintaining a position of easy balance. Remember what we have said about the lumbar curve. If you will stretch your arms high above the head it will instantly give you perfect poise and the best possible sitting position. But if you can secure a chair that will hold you in the same posture and allow you to relax and rest, you will have realized the ideal.

Finally, why do so many women maintain a more presentable sitting position than men? It's because they carry an artificial chair back or support, fitted to the body, under their corset cover. Uncorseted women commonly sit as badly as men, and often look worse doing it.

STANDARDS OF STRENGTH AND PHYSIQUE

By L. E. EUBANKS

IN the beginning, let us understand what is meant by the "average" man. Somehow the term has been confused with what is properly described as the "ideal."

Now, briefly, the average is the *mean* type *as found,* and does not indicate what development *may be;* the *ideal* represents perfection or approximate perfection. While the ideal weight, stripped, for a height of 5 feet 8 inches is 151 pounds, the average is only about 132 or 133—a great and very important difference, you see.

Authorities differ surprisingly in their numerical estimates. It seems there should be more agreement, but physical qualities vary widely, and the deepest research possible to one inquirer would touch only a small number of persons, relatively.

But all knowledge is relative, in any event, and we know at least as much of our physical selves as we do about the mysteries of mind.

In standing height we American men average, approximately, 5 feet 8 inches. Authorities do not agree on this, ranging from 5 feet 7.5 inches to 5 feet 8.3 inches. However, 5 feet 8 inches cannot be far off. We are not the tallest people, as some believe; several civilized nations, notably Sweden, and some savage tribes, show a taller average; but neither are we among the shortest: a certain Australian tribe shows the low figures of 52.75 inches; the Chinese average 65.35. Galton gives 67.50 for the English.

In sitting height the American male adult averages 35.8 inches. In this particular we learn from artists that the average is the ideal. It seems that any noticeable deviation in length of trunk detracts from the beauty of the body. Incidentally it may be mentioned that the long trunk and comparatively short legs characteristic of professional "strong men," though an indication of exceptional organic and vital power, constitute a chief criticism of that type of athlete.

The average man is woefully deficient in the chest; and Americans are in danger of sliding still further down here, owing to the ever-increasing preference for sedentary occupations. Our average normal chest is but 34 inches, whereas it should be about 39. Five inches means a great deal. The average lung capacity is a little more than 250 cubic inches, and it should be at least 300.

The waist girth, with the average, is only about an inch short at 29.

Other comparisons may be seen in the following table of the ideal compared with average measurements for a man 5 feet 8 inches in height:

AVERAGE	PARTS MEASURED	IDEAL
35.8	Height seated	35.8
70	Arm span	68
14	Neck	15
34	Chest normal	39
250 cu. in.	Lung capacity	300
29	Waist normal	30
11.75	Biceps	15
10.5	Forearm	12

AVERAGE	PARTS MEASURED	IDEAL
6.5	Wrist	7
35.5	Hips	35
20.5	Thigh	21
14	Calf	15
8.5	Ankle	8.5
133	Weight nude	151 to 154

Understand, the right hand column is given merely as perfect for that height—to show what a man of average height should measure; the question of an ideal height will always remain a matter of taste.

You will notice that our average man does not lack so very much in the legs; constant use of the lower extremities does a vast deal for their contour and strength. It is regrettable that we are not forced to develop our arms and chests similarly.

In strength this man is far, very far, from what he might easily be. Instead of being winded by a run of a block he could without much trouble train to trot three or four miles. That extra fifty cubic inches of lung power is worth any man's effort. And it is not at all impossible; the writer is 5 feet 8¼ inches tall, and has registered 350 several times on a thoroughly reliable instrument. This was reached from a beginning of 280.

Even the legs, wherein the average man carries most of his strength, are not what he might easily make them. In Yale University the average for our 5 foot 8 inch man was found to be 420 pounds. Now think of Herman Sell doing the deep knee bend correctly seven times with a bar-bell of 440 pounds across his shoulders! Also H. P. Hansen, of Copenhagen, did the same exercise sixty-five times with 277 pounds on March 19, 1899. George Hackenschmidt, the giant Russian wrestler, sat Turkish style and rose to standing position with 187 pounds on his shoulders. These facts show how weak the average man is in his strongest muscles compared to what he could be with a little training.

In a test of the back, our subject registers 345 pounds. The world's record for the "dead lift" is 1,897 pounds! The back press underneath a platform is 4,300 pounds by the same man, Louis Cyr, the French Canadian.

In the hand one would naturally expect a fair degree of power, but records show that the grip and wrist are remarkably weak. Even in the cases of our famous "strong men" the hand is comparatively weak. This should not be; a good grip is a valuable asset, useful in everyday life—or, at least, may be any time. The average man grips 94 pounds on this forearm test. He could probably double it in three months' practice! The writer easily sent the indicator around to 180 after only a few weeks of finger exercise.

In grip feats some remarkable records have been made, and mention of a few may be interesting: Louis Cyr lifted from the floor by the grip of *one* hand 987 pounds. He lifted with one finger, without artificial aid of any kind, 552½ pounds. (I believe the world's record is something over 600.) In card tearing many men have mastered two decks. I saw a professional *quarter* two decks and tear three. One well-known strong man claims to have torn five decks! Of course this may be "in the cards." A novel "stunt" was performed by O. C. Watson, a Denver physical culturist; he "chinned" a bar, or rather a ring, by the strength of a little finger alone and in that position held at arm's length a bucket of water on the little finger of the other hand!

The average person knows very little about the "marks of strength" in the human figure. As a rule he knows horses, dogs and chickens, but he would be utterly unable to examine a man's body scientifically and state correctly its condition and strength. Even among physical instructors there are many mistakes and oversights in the treatment of pupils.

Naturally, the first impression we get of a physique has to do with the general proportions of height and weight. A comparison of these two and a glance at the face to see whether it is florid or pale, constitute the popular diagnosis. I have seen some ludicrous blunders made in guessing at weight and measurements. The casual observer never thinks of the relation of the head to the shoulders. Men with undersized heads often appear much larger in the shoulders and chest than they really are, while a person with a large, broad head is usually underestimated in weight. Again, the verdict of good health on the evidence of a florid face is poorly founded. Where the circulation is strong and properly balanced there will be no very high color; the body will be more nearly the color of the face than is ordinarily found. I know of one boxer whose athletic ability is beyond question, yet he is considered pale; and I know another boxer of marked ability who has a better color on his body than in his face.

Now, to begin with, height is an important thing; but not as the popular mind regards it. Contrary to general belief, exceptional height is not a good sign as regards strength. There are not many very tall men who succeed in perfecting their proportions. In muscle tests they are greatly handicapped by poor leverage, caused by the length of their bones. Organically they are at a disadvantage and more susceptible to strain; the surface of their bodies being greater than that of shorter persons of the same weight, more effort is required of the organism to maintain the bodily heat; the heart must sustain a higher column of blood and, consequently, must work harder. I contend that the medium height is best for strength. I know there are famous athletes who stand above six feet, but they are exceptional and are strong in spite of their stature rather than by reason of it. I grant that tall persons have the advantage in certain games and sports, but I am writing of *strength.* Of course, if the sitting height is great compared to length of leg, this is some compensation, for it indicates large and vigorous internal organs. Launceston Elliot, the great English weight-lifter, is a magnificent specimen of manhood standing about six feet two inches; but his body is noticeably long. McArthur, who won the Marathon at Stockholm, is six feet tall, but he had unusual preparation for the race, having trained a number of years. Even so, he fainted at the finish and was a badly used up man. He stated that he suffered severely and was done with Marathoning forever.

As regards weight, it will be approximately correct as a natural result of good proportions. A few pounds' discrepancy either way from stereotyped figures need not matter much. Differences in the density of the bones, in the ages of the subjects, etc., must be considered.

The chest girth is an important measurement, but is sometimes very deceptive. A man may have an enormous chest but poor lung power. Chest expansion, as usually taken, only measures the contractile power of the external muscles. Of course these are valuable and I believe in their cultivation, but the true way of ascertaining lung capacity is by a volumetric test. How many cubic inches can the subject register on a spirometer or pneumauxetor? He should blow two inches for every pound of his normal weight. Many famous strong men who boast of chests of forty-five inches and weigh 200 pounds, cannot blow 300. Some of these men can "expand" from ten to sixteen inches! The writer "blew" 350 cubic inches when his chest expansion was only six or seven. This shows the error in the ordinary "insurance examination." Of course, the habitual breathing should be deep, easy and without any unusual sound. The diaphragmatic action should be free and this "abdominal capacity" should amount to one cubic inch for every pound of the normal weight. In testing the diaphragmatic capacity, great care has to be observed to keep the chest muscles out of the effort.

Externally the chest should be high, broad and full, with muscles, not necessarily massive, but well defined. The following rough rule may be used for approximate estimates in measuring the girth of a man's chest: Start with 33 inches for a height of five feet two inches; add inch for inch up to six feet. Chest depth is important, and should be consistent with the breadth.

The waist must not be too small. Some authorities argue for a great difference between the chest and waist; but I have never seen a proof of its desirability in tests of strength. Generally speaking, a difference of six or seven inches in small men and of eight to ten in the big fellows will be found right, I think.

In the average man the hips are as large as the chest; but they should measure a few inches less—from two to four, according to the height and weight.

Examine the neck carefully. If this part of the body is large and shapely without having been exercised particularly, it indicates the possession of a good constitution. This is not always the case, but I have found it generally so. A man five feet two inches tall should have a neck of twelve inches; for each additional inch in height one-half inch in neck girth is required. Well developed spinal muscles have the same constitutional significance as has a large neck. An erect, well-formed back is a splendid indication.

Square shoulders are considered indicative of strength. I consider their importance exaggerated; for most of our strongest men are not noticeably square shouldered. In fact, many of them rather lean to the sloping type. Most of the men who look fine in their clothes because of pointed shoulders do not stand examination well. Really, when the muscles at the base of the neck are fully developed and the deltoids are prominent, the sloping appearance is quite natural. It does not follow, at all, that the bony structure is different from that of other people. Broad shoulders are very desirable; they usually mean good deltoids and generally accompany a broad chest. In measuring shoulder breadth the calipers must be used; no other means is exact. The instrument should not be placed far down on the deltoid muscles, but just below the shoulder points. A well-built man of five feet two inches should measure 15.5 inches in this way. For each additional inch in stature we should expect about three-eighths of an inch in shoulder breadth.

In examining the arms note their length. Other things equal, short arms are stronger than long arms. Of course, any freakish abnormality in this direction is undesirable. On the upper arm two measurements should be taken; first around the greatest prominence when the arm is relaxed and held out horizontally at the side; secondly, when the arm is doubled up in the familiar "feel-my-muscle" position. The man showing the greatest difference in these measurements doesn't always have the "best" arm. The full contraction of the triceps is not measured in this process; and this muscle is fully as important as the biceps. Ordinarily, a small contraction on a large arm means too much fat, but in trained men the smallness may be only apparent—caused by the triceps making the extended measurement large. Ideal figures require that the contracted arm measure the same as the (normal) neck and (normal) calf; but this equality is rarely found. If the neck is correct the biceps may run an inch smaller without loss of proportion.

I believe in good forearms. Many trainers pay little attention to these. Good development here means a good grip even against the handicap of small hands. The wrist must be strong but need not be especially large. Thomas Inch, holder of several weight-lifting records, has only a seven inch wrist.

In examining the thighs, do not rely entirely on the measurement as usually taken. I have seen a twenty-two inch thigh prove much stronger than one of twenty-four, owing to the former's superiority at the important point—right above the knee. Also, due credit should be given the possessor of good back-thigh muscles. These are among the most neglected muscles of the body. As usually measured, the thigh of a man five feet two inches tall should be about seventeen inches. For every additional inch in height the thigh should gain three-quarters of an inch.

The calf is a deceptive muscle. It is often remarked that certain excellent athletes and strong men have very small calves compared to their other muscles. The movement of the foot by contraction of the calf muscles is a most perfect use of the lever principle. If the foot is short the leverage is good, and Nature sees no use for great motive power; hence the small calf. If the ankle joint is set far back, giving a long front foot and a short heel, big calves are almost inevitable. Africans are a long heeled race and consequently have small calves. So do not believe all thin calves weak; look at the leverage before condemning them.

In the tests of strength it should be borne in mind that from a health standpoint the marks made by the big muscles are of first importance. That is, the larger the muscle masses involved the greater the organic demand and (consequently) the greater their value in determining the functional strength.

The lung test, volumetric, is of prime importance. How regrettable that we have no such means of measuring the digestive power, nervous energy, etc.

Besides these measurements and tests, examination should be made of the skin, eyes, hair and nails. The skin should be warm, elastic and slightly moist; smooth and free from eruptions, of course. I have already said that its color should be neither pale nor flushed. A simple test of the circulation is to press the end of the finger hard against the forearm for a moment; if the blood brings back the usual color to the spot promptly, when the finger is raised, a good circulation is indicated.

The eyes are a good barometer of the general health, if there is no local defect to mislead one. They should be clear and bright with pupils jet black. The iris should be of uniform color; if it is streaked with brown and shows irregular spots, some organic sluggishness is indicated.

The hair will often show certain conditions of the general health, but it is by no means an infallible guide. There are many people with enviable "shocks" who are not healthy, and I have known remarkably strong persons to have very poor hair. Local scalp conditions have to be considered. Regarding hair on the body, the same remarks hold true. It usually denotes vitality, but there are many, many exceptions.

Coming back to the average man, there is another point of weakness which is all too apparent to any experienced observer. I allude to the muscles of the upper back and posterior neck. The lack of strength here accounts for the sunken chest and humped shoulders we see every day. Nowhere is the difference between the properly trained physique and the average figure more marked than in the chest, shoulders and upper back.

I have several times had occasion to correct a certain mistake regarding the proper development of the chest, and cannot forbear mentioning it here. It is this:

A man decides to fill out his chest and carry it properly, to take the "active chest" attitude. Immediately he works long and hard to develop his pectoral muscles (those on each side of the upper chest). These grow stronger, harden and *shorten.* Naturally they draw the shoulders forward and inward, concealing any real development the man may gain and cramping the thorax. This exercise is all right; but the main one should be an expansion of the arms backward with a resistance so arranged as to bring out the muscles along the spine and those between the shoulder blades.

Another serious weakness in the average man lies in the abdominal muscles. The "corrugated iron" development seen in some athletes may not be especially desirable, but a high degree of strength here is far more important than most persons realize. I have seen a number of people who could not stand the following easy test of the abdominal muscles: Have the subject lie upon his back with hands clasped behind the head. Now hold his feet and knees down and have him come to a sitting position.

Another muscle that is usually weak and undeveloped in men who have done no training is the biceps of the thigh, the flexor that draws the calf up to the back of thigh. Nearly all the leg strength possessed by the average man lies in the extensors or front thigh, and many physical culturists betray the same inequality. Note the beauty of contour in thighs that are well developed all round, and you will appreciate this posterior muscle. Picking up weights from the ground while holding legs fairly straight, and any branch of athletics that requires the feet to be brought well up forcibly, like hurdling, will call on these back-thigh muscles. Rope-skipping will do much for the average man here, and in other directions, too.

The average man falls lamentably short in physical development, but his muscular control—alas! he has none. To tense or harden the muscles of the upper arm or calf should be as easy to any person as to move hand or foot. Yet we find nearly all untrained men as helpless in this matter as wax figures. Now control is of decided value; a man with muscle bulk and no power of application nor ability to co-ordinate movements is only half a man. The study of control should go hand in hand with the development of muscle.

Control, being primarily a mental matter, leads us to the discussion of the average mental attitude toward the body. You may notice in nearly every case that the possessor of a good physique is proud of it. Now this regard for his physical self is no more the result of his development than it is the cause; that is, he thought of his body, reverenced it perhaps, cared for it—and was rewarded. The contempt for the body formerly a part of some religions is no longer countenanced. The motto of a famous English organization, "Sacred thy body even as thy soul," is worth world-wide observance, and not until we appreciate the rights and dignity of the physical side of our nature can we attain the ideal state.

In conclusion I submit a table of *average* measurements for the different heights as I have found them in about fifteen years of physical culture experience.

AVERAGE MEASUREMENTS FOR VARIOUS HEIGHTS

Height without shoes	Weight with clothes	Neck	Chest	Waist	Biceps	Forearm	Hips	Thigh	Calf	Lung capacity cubic inches
5 ft. 3 in.	**110**	12.50	29.50	25.	9.75	8.50	32.	18.	12.	**175**
5 ft. 4 in.	**113**	12.75	30.	26.	10.	8.75	32.50	18.50	12.50	**190**
5 ft. 5 in.	**120**	13.	31.	26.50	10.50	9.25	33.50	19.	13.	**207**
5 ft. 6 in.	**125**	13.25	32.	27.50	11.	9.50	34.	19.50	13.25	**220**
5 ft. 7 in.	**131**	13.50	33.	28.	11.25	10.	34.50	20.	13.50	**240**
5 ft. 8 in.	**140**	14.	34.	29.	11.75	10.25	35.50	20.50	14.	**255**
5 ft. 9 in.	**150**	14.25	35.	30.	12.	10.50	36.	21.	14.25	**270**
5 ft. 10 in.	**160**	14.50	36.	30.50	12.50	11.	37.	21.50	14.50	**285**
5 ft. 11 in.	**165**	14.75	37.	31.	12.75	11.25	37.50	22.	14.75	**300**
6 ft.	**170**	15.	38.	32.	13.	11.50	38.	23.	15.	**315**

STRENGTH TESTING

By MILO HASTINGS, B. Sc.

IT is said that exaggeration is the fundamental basis of the American sense of humor. Whether intended for humor or not, exaggeration in regard to the record feats of the world's strong men was very much in evidence before Christopher Columbus waded up the beach at San Salvador.

About that which a man loveth he boasteth. And when there is no accurate measurement of feats of strength, the reports thereof are likely to run to such ridiculous extremes as to throw all such performances into the nebulous regions of doubt where even conscientious truth tellers lose credit for their painful accuracy.

That we may have accurate records of strength and fair comparisons of one man's strength with another, it is necessary that the pull of proud muscles be exerted against some force, the resistance of which is the same one day as the next. Few strength records of the ancient past are accurate, because the science of the accurate measurement of weight and force is comparatively new. Lord Byron's duplication of the Greek god's swimming feat stands out as a delightful exception, for time and tide change for no man, and we have every evidence that the waters swish and gurgle through the Hellespont even as they did when gods sojourned on earth and paid court to the daughters of men.

The usual method of measuring strength as distinct from agility or endurance is either that of lifting dumbbells or lifting against the reaction of a recording spring instrument, as with the dynamometer used in gymnasiums and anthropometric laboratories. The lifting of dumbbells furnishes the most exercise, and the best sport, for there is some skill required, and some little time is consumed in the exertion of the strength. But the best means for testing the actual strength that can be exerted in one moment is the dynamometer. But dynamometers properly constructed for this purpose are rather rare and expensive instruments and will be available to but few.

Most of us remember the tests of strength and skill adapted by the men folks as they gathered around the farm barn while waiting for the turkey to finish browning on Thanksgiving Day. Chief among such tests was to see who could "lift the most" on the platform scales. The method involved was to squat upon the scales and reach the fingers under the edge of the frame which supports the platform proper. By straining or lifting in this rather awkward position the extra force of the lift is added to the weight of the man upon the platform. From the greatest weight that could be raised on the scale beam, the weight of the man was subtracted and the figure remaining gave the net measurement of the strength exerted. The method was accurate and sound, and afforded a fair comparison of one man with another; but the lifting position was awkward and did not give a man an opportunity to exert his full strength.

By taking the same sort of scales and putting a bar or board underneath the frame and attaching ropes or chains to the board and tying a crossbar at the proper height, the lift can be made in a more comfortable position and one in which the greatest strength can be exerted.

In the illustration here shown, hemp rope is used and auger holes are put through the board as in an old-fashioned swing seat, while a "half hitch" can be used. But even with the best knots known to sailor-lore, there is a certain stretch and slip in the rope that keeps the device from being quite perfect. A couple of light chains with hooks that would permit of ready adjusting and could not slip or stretch would make a perfect apparatus. Or one may determine the proper heights for various lifts and make a pair of wire loops for each.

Having devised such an apparatus, there are yet two points that should be observed if one would gain the best results. The height at which the bar is placed for each lift and for each person must be properly adjusted. The second point is that in lifting against a gravity scale there is this disadvantage compared with a dynamometer. In the gravity scale there is no record of the lift until a previously set point is reached. Thus, if we think we are going to lift 300 pounds and set the weight on the scale beam at that figure, and then made a lift of 299 pounds pressure, we have no record of it; whereas if we go a pound beyond the set point we have no credit for our extra pound. With the dynamometer, whatever strength is exerted is recorded. Hence in lifting with a scale it is desirable to learn the approximate weight that one can lift in a preliminary trial, and then come back after being well rested and make as few trials as possible to make the maximum lift.

The number of lifts that can be measured with the device herein described and illustrated is limited only by the fact that the lift must be done in an upward direction. We must pull or push upward.

Leg Lift. To adjust the lifting bar, stand with back and legs perfectly straight. Find the height at which the hands in front of the thighs will conveniently grip the bar. Then lower this position from three to four inches by bending legs. This will give you the correct position for lift.

Back Lift. The back lift is very similar to the leg lift in general position, but the absolute rule is that the legs must be kept straight at the knees. The back lift is much greater with the bar at the proper height than if one were to stoop over to lift a heavy weight from the floor.

Calf Lift. To perform this lift one must sit down, resting the weight of the body on a chair. If there is room on the platform to set this chair, the weight of the body, chair and apparatus will be deducted from the weight on the scales; but if the chair is set off the scales, as in illustration, the weight of legs and apparatus upon the scales must be determined before the lift is made, and such weight subtracted from the total lift as registered on the beam. The lift is made by raising the heels as high as possible. To exert the full strength in this lift, the bar must be very accurately adjusted, as there is only a couple of inches for movement. A flat board on the bar and a pad beneath the board will protect the knees.

Biceps Lift. In order to avoid any possible inaccuracy due to lifting with other muscles, it is necessary to make a rule that the biceps' lift be taken with the arms from the elbow to the wrists held as nearly as possible in a horizontal position. The bar may be held at such a distance in front of the body as one finds suitable to the exertion of the greatest strength. The most likely position will be three or four inches from the body.

Shoulder Lift. (Push up with the arms.) This is similar to the classic movement of pushing up a barbell above the head. The limit in pushing up the barbell is determined by the weakest position, and hence this lift, to be most comparable to the push-up with the bell, should be taken with the elbow raised until the upper arm from the shoulder to the elbow is horizontal. In the illustration the elbows are held a little too low.

By chaining the lifting bar down to within a couple of inches of the scale platform, one may lift with the toes, thus measuring the strength of the flexor muscles of the lower leg. In the leg lift as well as in all arm lifts, it is obviously practical to measure the strength of the limbs separately as well as together. In the leg lift the muscles used are those that straighten the knee when bent, and these form the greater bulk of the thigh muscles. The muscles on the back of the thigh that bend the knee can be tested by holding the thigh vertical and bending the calf up horizontally behind, and lifting with the back of the heel. In this position one may be found to be surprisingly weak. The heavier use of these same muscles as well as the muscles of the buttocks may be made in straightening up the body when bent forward at the pelvis. A test of the strength of these muscles, as well as those of the back, can be made by standing with the legs straight, and bending the trunk forward until it is nearly horizontal; then lifting with the bar on a pad on the back of the neck. As proof that this is a leg lift, the strain will be found to run down the backs of the thighs to the insertion of the cords below the knee.

The muscles of the trunk are not capable of making many different lifts. The ordinary back lift practically includes them all, though one could measure the strength of the abdominal muscles by lifting when leaning very far back, or better, by lying on the back across a chair or bench with the feet strapped down and attempting to raise the body with the abdominal muscles.

There are a number of minor lifts which may be devised for the arms. If the legs and spine be held perfectly straight and there is no stretch in the apparatus, it is possible to make a lift through a small distance by merely raising the shoulders. To measure the strength of the neck would be easy if one found a suitable way of making the bar stay placed on the head.

The most powerful lift that can be made on platform scales is the lift in harness, in which the record is 3,239 pounds, whereas the greatest record made when the strength must be exerted by gripping with the hands is but 1,384 pounds.

THE TRUTH ABOUT WEIGHT LIFTING

By CARL EASTON WILLIAMS

MANHOOD means strength.

At least it ought to. Any man between the ages of twenty and fifty who lacks at least average strength is almost bound to lack also a certain degree of self-respect, if his instincts are entirely normal. If you are not strong, vigorous, quick, alive in every inch of your being, then what kind of a man do you call yourself?

There is only one way to get strong.

You can not gain strength simply by drinking plenty of pure water, breathing plenty of clean air, or by concentrating on your subconscious mind, even if you know how. And you can not gain strength simply through eating pure food, hygienically prepared and in scientific quantities.

The only way you can get strong is through exercise—real exercise. You must exert your strength in order to build strength, and the amount you build and keep will be in proportion to the amount that you expend.

In order to get results from exercise it is necessary to employ resistance of one kind or another to the action of the muscles. It does not matter whether this resistance is supplied by the weight of your own body, by the person or muscles of another individual, by weights of any kind, by springs, elastic cords or other mechanisms, or even by the trick of opposing one group of muscles against another group in your own body through mental control. The important thing is resistance. And the amount of strength that you develop will be in proportion to the amount of resistance that you habitually overcome in your daily exercise. A consistent and logical program of strength building, therefore, really involves the use of a moderate amount of resistance in the beginning, suited to one's limited strength at the time he begins his task of physical improvement, and the use of a progressively increasing resistance as he gradually gets stronger until a normal condition is reached.

It will be clear from this, therefore, that light exercises, whatever their virtues in special cases, do not offer a complete or satisfactory system of physical training for the average man. The light, free movements commonly used in class drills or calisthenic work at home are excellent for the beginner. They are suited to the condition of any one who is unaccustomed to physical activity, but as soon as they have really accomplished their purpose of improving the circulation and toning up the muscular system, they become inadequate because they no longer have any material effect. For the chronic invalid, or perhaps the sufferer from heart trouble, light exercises of this kind are entirely satisfactory. But for those who are strong, and for those who are trying to get strong, light calisthenic work is far from sufficient. One soon reaches a condition in which one or two hundred repetitions of a certain exercise may not fatigue him. In other words, he has reached the point where this exercise is no longer exercise. He needs increased resistance. If repetition of light movements meant strength, then a typewriter girl would be able to outgrip Frank Gotch.

Extremes of strength, such as will enable one to lift horses and elephants, or to pick up with the teeth great hogsheads of beer or sauerkraut, or whatever it is that they pack in hogsheads—such extremes of strength are abnormal and not half as much to be desired as extremes of wealth. As a matter of fact, only a limited number of men have the constitutional foundation that will enable them to rival our Sandows and Saxons. Very few of us care anything about rivaling the ox or the hippopotamus, but every one ought to have the strength that will justify him in calling himself a man. Every one of us ought to be well set up, vigorous and capable of handling our own weight freely and easily under all kinds of conditions, or of carrying easily or opposing the strength of another person of our own weight. This is not an impossible ideal. It represents only the normal development which every man should attain, if only for the sake of his own self-respect, as already suggested.

Now, it is because weight lifting has been found to be the quickest and most effective means of building unusual strength that old time physical instructors have used it so much. It produces results. On the other hand, weight lifting has been frequently condemned by others who claim that it produces a muscle-bound condition, slowness of movement and bunchy, unsightly muscles.

What is the truth about the value of weight lifting for the average man? There is no doubt that for the strong man of the circus it is the unqualifiedly proper thing, but how about you and me? The question of the advantage of weight lifting depends partly upon what you are exercising for. Are you looking for strength? Are you looking for constitutional benefit?

We may differentiate various forms of exercise in three groups. First, we may take exercise for the sake of body building or the development of strength. Second, we may take exercise for constitutional purposes; i. e., for improving the circulation, toning up the internal organs and promoting the health generally. Third, one may practice special exercises for that training of the brain and nervous system which is involved in the attainment of skill. The cultivation of endurance involves a combination of the first two. Strength is necessary for endurance, but the latter involves the improvement of the internal organs and the quality of the blood to such an extent that its requirements are strictly constitutional as well.

Now, many forms of exercise partake somewhat of all three of these classifications, yet there are certain forms of exercise which will serve chiefly for only one or the other of these purposes. Certain games chiefly involve the development of skill—brain and nerve training. There are others, like walking, mountain climbing and cross-country running, which are mainly constitutional in their effect. And there are still others, like weight lifting, which are primarily strength and muscle building. Wrestling is an ideal combination exercise for strength and endurance, or strength and constitutional improvement. Golf combines skill and constitutional benefit.

While the ideal form of exercise for you and me would of course be something of a constitutional nature, yet a normal measure of muscular strength is really the foundation even for that, and for this reason nearly every one needs a certain amount of purely development exercise.

There is nothing fundamentally wrong with the theory of weight lifting. It is the abuse of this form of physical training that may result unfavorably. For the rugged and stocky type of build, a certain amount of weight lifting may be regarded as an ideal form of training. In the case of other men of comparatively frail physique, with light bones and poor development, the lifting of heavy weights would be out of the question. But even a light boned man should build up strength proportionate to the type of physique that he represents, and intelligence in the use of light weights suited to his requirements would, undoubtedly, offer one of the most perfect means of gaining the development that he needs. The trouble is that the untrained man is prone to attempt to lift big dumbbells simply because the Professor does it. If the frail beginner had sufficient judgment and restraint to start in with weights of fifteen or twenty pounds, doing a little work each day, and was then satisfied to increase the amount of weight used by a few pounds at a time from week to week, he would progress naturally, scientifically and healthfully to a condition of strength of which he might well be proud at the end of several months. In other words, even the slender type of man may profit by a system of weight lifting, intelligently laid out.

Another important thing for the beginner to know is where to leave off. If he keeps on progressing he will reach the point at which he will attempt to handle weights that are too heavy for him. This is largely a matter of judgment. The rugged and stocky type of man is not likely to hurt himself. Probably a gool plan in all cases, but especially for the man of small-boned physique, is to keep within the limits of easy effort. If you experience a trembling sensation following an exertion, then you may know that it has involved too great an expenditure of nervous energy. In that case, make haste more slowly.

It is not the writer's purpose to give detailed instructions on the scientific handling of weight. You do not need a gymnasium, for you can secure a barbell of adjustable weight, i. e., one to which you can add a few pounds at a time, or take away from, as your needs may require. I would suggest a very simple plan of exercise that will be both beneficial and enjoyable. It is a plan of using a moderate weight, such as will give a fairly satisfactory measure of resistance and yet avoid the possibility of strain. In a word, the system suggested by the accompanying illustrations is one intended not so much for developing great strength as for pure health building purposes. It will answer splendidly for that ten or fifteen minutes per day which some of us busy people set aside for exercise, irrespective of all other demands upon our time.

The idea of this mode of training is to secure a bar of moderate weight to give real resistance to your efforts and yet avoid the possibility of strain, as already suggested. Take, for instance, a weight corresponding to two-thirds or three-fourths of what you are capable of lifting with your greatest effort. This means that you will be able to handle it comfortably and easily with a number of repetitions of each exercise. It will mean real exercise and the expenditure of considerable strength, and will be found very interesting as compared with ordinary free movement work because weight lifting happens to be one of the most absorbing and fascinating forms of exercise known. There is something about it which makes it interesting, probably the mere satisfaction of overcoming a considerable amount of resistance.

It should not be necessary to spend any money for the purpose. The chances are that somewhere around home you have an old piece of lead pipe that is just about the right weight. Perhaps you can get hold of a good iron bar for the purpose. Any piece of iron that is not too heavy may answer. If you are the average man it is quite possible that a bar of one-third or one-half your own weight will suit you nicely. Perhaps you would want it a little lighter, possibly a little heavier. You can judge that for yourself.

Once in a while some physical culture enthusiast complains that in spite of much time devoted to exercise he has failed to improve his development. Probably in most of such cases, the development is already normal. However, it may be worth while suggesting that a little attention to weight lifting might solve the problem in many such instances.

One does not necessarily need to keep it up until he has made a modern Hercules of himself. Nor does it necessarily follow, on the other hand, that because one is developing an extraordinarily powerful muscular system his health is being sacrificed. It is possible to overwork in the direction of muscle building, just as one may overwork in business life or in farming. It is true that even professional strong men have been known to have poor health. They have suffered from disease, and a few of them have died early, just as have other athletes, but this is not a necessary part of unusual muscular development. The chances are that most of those who have taken up weight lifting as a means of development have been far healthier men than the average man of inferior physique, and much healthier than they would have been without this exercise. It is not true, generally speaking, that muscularly strong men have weak organs. Why should they? There is every reason why, as a rule, they would have better organs than the average, just as they have better bodies in other respects.

It is not my purpose to recommend weight lifting by wholesale. There are so many other forms of exercise that there is no need of weight lifting, even for strength building, if one prefers other types of exercise. On the other hand, there is no real objection to weight lifting for those who desire it. It is unquestionably an effective strength building method. Practiced exclusively, there is no question that it makes one slow, but if one does a moderate amount of weight lifting and keeps up other forms of exercise in which great speed and activity are involved, he may develop or retain speed at the same time that he develops strength.

My own recommendation to those who desire to take up weight lifting would be to use it as only a part of one's system of training. Use it as a muscle builder to lay the foundation for other athletic work. At the same time, practice bag-punching, boxing, baseball, running, tennis, and other games which make for speed and skill. And do not forget that as a permanent system of setting up exercise the movements illustrated, in conjunction with a bar or pipe of moderate weight, is well worth trying out.

Perhaps the first thing to learn in handling a weight is the necessity for keeping your eye on it at all times. Do not attempt to push the bar above your head while looking off at the distant landscape. The question of balance is of supreme importance in this form of exercise. You are likely to lose your balance and possibly strain yourself unless you keep your eye on the bar.

Another important fundamental necessity is that of keeping the back straight, or nearly straight, in picking up weights from the floor. Reach down by bending the legs at the knees. The extent to which you accomplish your lifting work by the large and powerful muscles of the legs rather than by the arms, will surprise you when you study the mechanism of weight lifting.

At the same time, you will understand that the handling of any weight involves practically all of the muscles of the body. If it is properly done, the strain is distributed, as it were, among the different muscles. The back, the powerful muscles of the stomach and abdomen, the legs—all are involved in the vigorous "base of support," which enables the muscles of the arm to maintain or push up the weight properly balanced.

It is for this reason that weight lifting is such a remarkable form of exercise for building symmetry. It is not true, as many suppose, that the characteristic weight lifter has an exaggerated biceps; if anything, one would expect him to have an exaggerated *triceps*. The fact is however, that of all athletic types the man long trained in weight lifting has the most symmetrical development of all other parts of the body, including the legs. This is true, not merely because these various parts may be particularly strengthened by special movements intended for them, but because even in the arm lifting all of these other muscles are vigorously brought into play.

No definite instructions can be given as to just how many repetitions of each exercise are desirable. It would be best in the average case, however, not to force the exercise too far. Do not continue any movement until extreme fatigue is reached. If you wish to develop the utmost strength and endurance, it will of course be necessary to exercise to the point of marked fatigue. But where constitutional benefit is the main object, you should stop before you have gone beyond the stage of feeling stimulated and full of energy.

HOW CHILDREN SHOULD EXERCISE

By BERNARR MACFADDEN

HOW can we make our children strong and sturdy? A good start in life is everything. "As the twig is bent, the tree is inclined."

It is chiefly a matter of proper physical training. It is true that much depends upon nutrition and proper care in other respects. And the fact of having been born with a strong constitution means a great deal. But what about the puny, delicate child? We want to make him strong also. The fact is that exercise is far more effective in childhood than in later years. The results are more immediate and the corrective and remedial possibilities are infinitely greater. Besides that, it means health. Exercise does not merely mean stronger muscles. It means better circulation, more functional power, better elimination of body wastes, and consequently purer blood and more nerve force generally.

Play is probably the most important factor in child life, aside from the question of proper food. Play is indispensable. Every normal child is impelled by his natural instincts to play almost continuously through his *waking* hours—and in the case of a vigorous child this play will assume a very active form for the most part. The child's mind is educated and trained through play as well as his muscular system. I have no doubt that more hours spent in play and fewer hours spent in school by growing boys and girls would result in making them better men and women from every standpoint. Kittens, puppies and the young of all animals train their minds and learn the use of their muscles, and at the same time develop their muscles, chiefly through the activity of spontaneous play, which is Nature's great and universal school for all forms of life. Regarded purely from the standpoint of exercise, play has the great advantage of sustained mental interest. The fact is that a healthy child, being very much upon the same plane as any other young animal, is likely to secure in the form of play just about as much exercise as he may need for his constitutional requirements.

But in the matter of physical development it is often otherwise. In many cases the mere activity of play is not enough. It may be sufficient to provide for the welfare of the heart, lungs and functional system, without providing the means for correcting special weaknesses of the back, chest or other parts. And insofar as weaknesses of this kind may affect the general carriage of the body, causing the stooping of the shoulders, the cramping of the chest, the depression of the ribs, and the crowding of the digestive organs below, it will be seen that even for constitutional purposes play may not be sufficient. Special training in such cases will be necessary. Every boy and girl should be "well set up," with a good erect carriage, head properly held up, full chest, strong back, well set shoulders, and a firm, vigorous condition of the abdominal region. To the extent that ordinary play fails to provide for this condition, other systematic exercise will be required. A child may play ever so much and yet fail to build up a robust body, just as many adult athletes, however active in their respective specialties, are far from models of symmetrical development. The fact is that persistent, systematic exercise will accomplish what play alone never can accomplish in building strength and in perfecting every part of the body.

Now, it may be that for some robust and active children, play will be sufficient, because they will naturally adopt the more energetic forms of it. And again, some children seem to have a natural muscular development. This, of course, means that they develop very easily and seem to enjoy a condition of remarkable vigor without the necessity of special training to acquire it. They are fortunate. As a general thing they are naturally stocky. But for the child who is naturally delicate and undeveloped, as for the man or woman who is undeveloped, nothing can take the place of systematic training. Usually it is the slender types of boys and girls who most require special exercises, particularly if they are inclined to be nervous, or if they belong to that class of very "quiet" children who have a tendency to look at pictures and play with blocks in early childhood, instead of running and romping, and later on are inclined to sit in a corner and read a book instead of getting outdoors to go skating or coasting or playing tag. These children should have special attention.

It should be noted, however, that mere slenderness in itself does not mean lack of energy or a poor condition if the child is otherwise sound. Remember that there are different types of children just as there are of men and horses and dogs. Some are naturally heavy and thick-set, and some are naturally slender, with light bones. The slender boy or girl may be in perfect health, with good color, a hearty appetite, and a seemingly remarkable degree of strength for weight and build. When in the right condition such a boy is usually a good runner and one of the most active of all types of children. So slenderness does not necessarily mean backwardness or weakness. But when a child is thin as a result of lack of development, and when this condition is accompanied by a pale face, poor carriage, a hanging head, round shoulders, flat chest and pouchy abdomen, then he certainly needs careful and continuous attention, with a proper course of systematic corrective exercise to build him up. If quiet or nervous, his play will not give him more than a fraction of the constitutional exercise required, and he will need to be encouraged to engage in the various sports and games that ordinarily interest children.

On the other hand, the fact that a child is large, or belongs to a naturally heavy type, does not necessarily mean that he is as vigorous as he should be. The heavy child is more likely to be sound and normal. But sometimes he has simply grown rapidly and has a heavy framework of bones, but without the development and stamina that ordinarily go with his height and weight. Especially if his carriage is faulty and his chest and shoulders are not properly set, he is as much in need of special exercise as the boy who is thin because he is frail. If he breathes through the mouth, which may indicate adenoids, he should have plenty of outdoor play and special training in breathing exercises and chest expanding movements. I might say, also, that while a serious case of adenoids will require removal, which is a very simple operation, yet in a great many cases these growths will disappear by themselves with enough outdoor life and active exercise. The fat boy is, of course, abnormal, and his measurements indicate nothing as to his real development, except in the matter of chest expansion and the difference in the measurement of his biceps when the arm is extended and flexed. Later on the boy who has grown fast and is much bigger and heavier than the other boys of his age should have special attention, for it may happen that his heart has not grown proportionately and he may not have the stamina of a boy who has grown more slowly. He should not be allowed to compete in football and other games with boys five years older than himself just because he is as large, for the reason that he is not yet so strongly knit and can not be expected to have the same endurance. Special training in such a case will be of benefit, together with supervision in the matter of athletics and sports.

In early infancy not much in the way of special training is desirable. One really should not try to force a child's development at any time. It takes between twenty and thirty years to grow a man, and his development is necessarily a matter of slow growth. A puppy or kitten can creep around the day it is born, but it takes months for the human baby to learn to do even that. A baby baboon from the very first is able to hold its own weight by clinging with its hands to the hair on its mother's chest, being carried around in this way. Of course the baboon is not so far removed from the human race, and the human infant likewise has a considerable power of grip. The occasional human infant can hold its own weight when born by hanging on to a small stick or a couple of fingers with its hands. But even this is only a survival from a previous stage of evolution, and a baby of our species in the beginning is entirely helpless. A colt can walk the day it is born, but the baby cannot walk for a year, more or less. The human being has a higher organism to develop, and it takes longer. A dog a month old knows more and has better control of himself than a child of many months, but he will not know more than a fraction of what the child knows when he gets through growing.

So in training the child, do not try to force his growth. Try simply to follow his natural growth and merely make him strong. Don't try to make him walk before his brain cells are ready and his bones are strong enough. You cannot hasten his growth, but you can do some harm by trying to.

In the first few months of the baby's life, therefore, content yourself with giving him plenty of freedom of movement, so that he may proceed to train himself by kicking and jerking his arms around until he finds out for himself that he has legs and arms and that he can move them in some definite manner according to his desire. The trouble is that babies are usually bound and harnessed up with too much clothing and don't get a fair chance at cultivating footwork or punching an imaginary bag while lying on the back. Better keep the little feet warm by heavy socks than by an extra yard of skirt. When the baby has his air bath, however, just before giving him his warm water bath, you may rub his back with the bare hands and exercise his arms and legs with passive movements. You may also try out his grip by letting him take hold of your little fingers and lifting a part of his weight, perhaps pulling him up to a sitting position. In a few months you may practice lifting his whole weight by the arms, by the legs, by the left hand and right foot and by the right hand and left foot. And this is about enough. Do not try any "stunts" with a young baby. And aside from this very moderate amount of training, the infant should depend mostly upon his own exertions for his exercise.

When between two and five years of age, a child may be given some special attention in the way of training. When two years old, if he is an average child, he should be somewhere in the neighborhood of 31 inches high and 27 pounds in weight, during the next three years gaining about three inches a year or a little more, and four or five pounds a year, until at five years of age he is somewhere near 41 inches tall and 40 pounds in weight. After that he gains about two inches a year, and his weight is about doubled at about twelve years. Of course there is much variation in height and weight. A child may be either over or under these figures and still be perfectly normal and vigorous. But if he approximates these figures you may be assured that he is all right, so far as weight and height are concerned.

When children are between two and five years of age it is well to have them exercise with other children of similar age whenever it is convenient, for it will stimulate interest. Naturally the play spirit should prevail so far as possible, not only with children at this age, but at any age, in performing almost any kind of exercise. Of course the play idea should never lead to such frivolity as to offset the effectiveness of the exercise, but the element of play should enter, perhaps, in the form of competition to see which child can execute an exercise the most perfectly, who can stretch the higher, or whether a single child can do a thing better than he did it last week. With these very little people, however, it is especially advantageous if they can exercise together in little groups of two to four. Children between five and ten years, on the other hand, may commence to exercise individually, for they will be capable of understanding the purpose and each one can make a specialty of any movements that he may need for corrective purposes. But even with boys and girls at this age, a little company in the matter of general "setting up" exercises may help to lend interest.

Variety should be the keynote of exercise for very young children. Incessant change will suit them best, and nothing that seems to call for endurance should be attempted. Let the exercise be active, but not long continued. It is important to provide little girls with clothing that gives them approximately the same freedom that little boys enjoy. Fancy white dresses may be pretty, but they are not serviceable for purposes of play and exercise. Bloomers should be an important part of a little girl's clothing.

Children from five to ten years of age may be given a great deal of special training if they need it, and it is at this time that special corrective exercises are particularly effective. By this time they generally develop a love of strength for the sake of strength, and are capable of taking a certain pride in the body and its development, all of which may be turned to good account. The best thing one can do for children at this age is to provide some form of simple gymnasium in or about the home. A backyard "gym" is a fine idea if you have the space around your home. Sometimes an ideal exercise room may be fitted up in the loft of a spacious barn. Or an extra room in the house may be given over to the purpose. You do not need much apparatus.

Children are primitive by nature, and they naturally find their greatest interest in these primitive, physical activities. But for building real strength there is nothing like the formal systematic exercises already referred to. Each exercise has a specific result, and a few well selected movements will go a long ways. Generally speaking, they may be much the same as those which are usually recommended for adults, for the same purposes. Bending exercises are especially good for children, and they can always do them well because of the natural suppleness of the body in childhood. Stretching exercises are particularly to be recommended when the children are from five to ten years of age, not only because they are favorable to proper growth and the perfect alignment of the spine, but also because they lift the chest and are conducive to proper carriage, thus also keeping the abdomen firm and the internal organs in position.

A flat chest is a rather common weakness, and while running will do much for such a child, he should give his lungs more room by developing the chest through special exercises. This does not mean exercises for the chest muscles so much as those that bring the shoulders back, and expand the chest. All movements which raise the arms high above the head will be effective. Movements which bring the shoulders back and then down are particularly appropriate, and a circular movement of the shoulders, forward, then upward, then far back, then vigorously downward, will do great things for a flat or sunken chest. The same line of treatment will be very effective in a case of what is known as "chicken breast," and if taken at this time of life such a defect can be practically obliterated. In fact, even at the age of twenty, corrective exercise of this kind will work wonders with such a condition. Give special attention to the position of the head, for if one holds his head up his general carriage of the body is likely to be satisfactory.

A thin and puny neck is frequently an unsightly feature of the delicate child, but it is one that responds most readily to exercise. It will improve as a result of the general development gained through play, but special neck exercises are necessary to get a truly satisfactory improvement.

Weak hands are not unusual, and call for much practice in gripping, the best plan being to do a great deal of lifting of the body or hanging on ropes and horizontal bars. Broomstick exercises and little tug-of-war exercises are splendid for this purpose, as well as for the back and legs.

Weak ankles and tendencies toward flatfoot are not infrequent. Low heel shoes, or so-called "spring heel" shoes should be worn, free from "arch supports" and fitting well around the instep, but with plenty of space for the spread of the toes. Going barefooted and wearing moccasins or sandals would be good treatment in such cases. And after the feet have been thus provided for, plenty of rope skipping, dancing, running and skating should be indulged in, together with special exercises at home, which should consist in rising high on the toes and on the heels, circular movements of the feet, and bending inwards and outwards as vigorously as possible. Persistence is what counts in these cases. It is easy enough to avoid flatfoot and to strengthen the ankles. Bow-legs and knock-knees can be much improved at this age. Deep knee bending, or "squatting and rising" exercises, are very effective in such cases, though mechanical pressure should also be brought to bear in the required direction many times each day, even if it is only pressing with the hands.

At from ten to fifteen years of age the exercises can take on more nearly the character of exercises for adults, pure and simple. Boys at this age can commence to do resisting exercises, and will be ready to try out the strength of their arms, shoulders and back in various simple ways. Wrestling, for instance, would benefit them. Girls at this age, however, should give special attention to exercises for the waist, chest and pelvic region.

So far as growth is concerned, one should not take published tables too seriously as applying to individual cases, for a child may be normal and yet not conform closely to the "average" as expressed in such tables. In this way the "What you should weigh" tables found on penny-in-the-slot weighing machines are more or less misleading, for they refer to averages and ignore the question of variations in type. The fact is that the normal is probably above the "average" in many respects, since the average includes such large numbers of those far below normal in development and health. And yet slenderness of type may place a perfectly healthy and normal person below this average. So do not worry about measurements if your boy or girl is healthy and vigorous. The question of energy is more important than measurements. At the same time it may be of general interest to know that boys of ten years may usually be expected to run from 52 to 54 inches in height and weigh between 60 and 70 pounds, that boys of twelve years will be from 56 to 58 inches tall and weigh from 70 to 90 pounds, with an average of about 80, and at fifteen years will be from 63 to 66 inches tall and weigh from 115 to 125 pounds. Girls at ten and twelve years may be expected to average a little under these figures, and at fifteen may slightly exceed them.

THE OLYMPIAN SYSTEM

"Mens sana in corpore sano"

PART ONE

EXERCISE

SECTION TWO

CONSTITUTIONAL

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THE SEVEN AGES OF EXERCISES

By HENRY SMITH WILLIAMS, M.D., LL.D.

IN any discussion as to the value of exercise we must bear constantly in mind the fact that the human machine is a mechanism that undergoes a fairly definite series of modifications with the lapse of time. In other words, the factor of age must always be considered when we attempt the specific discussion of exercise in its relation to health and longevity.

It will perhaps fairly accord with the stages of development of the average individual, and will serve a convenient purpose for the present discussion, if we think of the normal life as spanning seven periods or ages—not, however, delineated in accordance with the Shakespearean tradition. Speaking in general terms, we may define these epochs as follows:

(1) Childhood, up to about the age of 10.
(2) Adolescence, from 10 to 17.
(3) Early maturity, 17 to 25.
(4) Full maturity, 25 to 40.
(5) The "old age of youth," 40 to 50.
(6) The "youth of old age," 50 to 65.
(7) The period of decline, above 65.

Of course individuals differ as to the rate of development, and also as to the precise period at which retrogression sets in; but I think we may take the ages above outlined as fairly representative of the border lines between the different epochs in a normal life. The actual lines of demarcation are, naturally, far less fixed and arbitrary than the citation of a census of birthdays would indicate.

My present purpose is to attempt to outline, briefly but explicitly, the kind and amount of exercise that is in my judgment desirable for the average individual of fairly normal constitution during each of periods in question. The judgments about to be expressed are personal opinions based on first hand study of a large number of individuals, including many remarkable athletes both amateur and professional. Let it be understood at the outset, however, that I am here speaking not so much of the development of the athletes as of the normal amount of exercise desirable for the average individual who has no thought of entering into athletic competition, but who does desire to secure the largest possible modicum of health and to give himself the best possible prospect of longevity.

First, then, as regards exercise for the child under ten years of age. At first thought it might appear that no set rules and no fixed exercises are necessary or desirable for the normal child, inasmuch as the tendency to exercise is spontaneous, and the desire for the playing of games seems instinctive. And such a contention is not without a measure of force. It should be recalled, however, that one of the distinctive characteristics of the child's organism is that in the early years the brain structure develops in size quite out of proportion to the muscular structure. A boy of nine can very commonly wear his father's hat, though he would be quite lost in the parental coat and trousers.

As a result of this preponderance of brain over muscle, there is a surplusage of nervous energy that tends to find an outlet in incessant activity. Nor is there great danger that such activity will lead to dangerous excesses, for the healthy child when exhausted falls into a profound sleep, and recuperates rapidly. The danger is rather that the child will be made to utilize too large a share of this energy in school studies at an early age, and be physically confined in house or schoolroom for so many hours that time does not remain for adequate letting off of steam on the playground.

Modern educators realize this danger, and introduce systems of calisthenics that are not without their uses. But such cut and dried exercises are after all a very poor substitute for competitive games.

If the time devoted to calisthenics could be given over to sparring, wrestling, or running, the results would be far more beneficial. But of course this is not always feasible.

It should be made possible, however, for every boy to take some lessons in sparring and wrestling before the age of ten. There is no reason why he should not thus be taught to use his muscles effectively from the outset. Every boy has occasion at least a few times in the course of his school period to settle a dispute in primitive fashion, and, while a "rough and tumble" fight has undoubtedly merits, yet such a contest gives every advantage to size and mere strength and is conducive to the fostering of the spirit of the bully; whereas it is a salutary thing to have both the strong and the weak convinced early in life that feeble muscles trained to act in proper co-ordination may be counted on to hold their own, and more than hold their own, against far stronger muscles that lack this training.

I would not seem to lay too great stress upon such training, however, for the child under ten years of age. The thing that I would emphasize is that during this period the child should have opportunity to mingle much with fellows of its own age in the open, and should be urged to take part in the rough and ready games of childhood. Few things are more unfortunate, and more likely to handicap the child later in life, than the development of a tendency to keep away from its fellows, avoiding that healthful competition through which excessive egoism and egotism are curbed and the fundamental lesson inculcated that human society is an institution that necessarily puts restrictions on the liberties of the individual, requiring to some extent the curbing of primeval instincts, and putting a premium on self-control no less than upon self-dependence.

If I may seem to dwell too much upon the question of training the individual during this first period, I would reply that the old saw about the bent twig expresses a profound truth; and would urge that few persons other than physicians who have made a special study of the subject realize to what extent the training, both physical and mental, of the first ten years of an individual's life determines not merely the broad outlines but even the details of his future activities.

Equally critical, though in a somewhat different way, is the period of adolescence—say from ten to seventeen. During this period the physical organism undergoes profound modifications, and both body and mind are subjected to dangers that until recently have been considered to lie outside the scope of popular discussion. Against these dangers, perhaps the most important of safeguards is physical exercise. Under existing conditions of society, it is not usually feasible for the newly focalized energies to have a normal outlet; and the best substitute is found in muscular exertion, along the lines of competitive sports, carried sometimes to the point of healthful fatigue. Such competitive exercises develop courage and self-control even as they develop the muscular tissue; their effect on the mind is no less beneficial than their effect on the body.

Of course it must not be forgotten that the body during this period is by no means mature. On no account should the youth under seventeen be permitted to take part in contests that require excessively prolonged effort. If he boxes, the bouts should be limited to six two-minute rounds. If he wrestles, he should be matched against an individual of comparable strength and skill, and should never go more than ten minutes at a bout. If he runs, he should confine his competitive attempts to 100 yard or 220 yard dashes; never going the half or the full mile, much less undertaking the Marathon distance.

The main reason for insisting on these restrictions is that the heart, no less than the other muscles, is developing during this period, and may very readily be made to take on excessive growth, preparing the way for future difficulties that may make the individual a chronic invalid in middle life, or may bring about a fatal issue from "heart disease" before the normal time of full maturity.

The same reasoning applies, though with somewhat abated force, to the conditions that should govern exercise during the succeeding period, when the individual is entering full manhood—the period that we have roughly outlined as between the ages of seventeen and twenty-five. During this period the muscular system often seems to reach its acme of energy and responsiveness. The championships in running, swimming, jumping, and at tennis and allied games, are very generally held by youths under twenty-five. Nevertheless, it is, I am confident, a mistake to suppose that the muscular system normally reaches its fullest development and its greatest possibilities of efficient activity before that age.

The chief reason why so many athletic championships are held by youths is that it is chiefly youths who, in the nature of the case, are free to compete.

Soon after a young man leaves college he usually finds himself preoccupied with business cares, and is no longer able to give sufficient time and attention to training to enable him to keep in the championship class. But it should be recalled that athletes who hold professional championships usually get their honors after the age of twenty-five.

It is pretty obvious, then, that the muscular system is only approaching full maturity, not reaching its full climax, in the period from seventeen to twenty-five. In my opinion, the individual during this period should be regarded as still lacking something of seasoned maturity, and should refrain from putting his muscular powers to the fullest test of endurance. I think it highly unwise that Marathon races and four-mile boat races should be permitted at all; but if they are to be countenanced, I believe that the persons indulging in them should be at least twenty-five years old, and should have conditioned themselves for the effort through long periods of carefully graded exercise. The accomplished turfman sends his two year olds and three year olds to the post carrying light weights and asks them to go only short distances. He knows that a horse should be fully matured before it is asked to carry heavy weights and to go the full mile or mile and a quarter. Common sense requires that the same principles should be applied to human athletes; and experience tells us that the average individual does not reach full physical maturity much before the age of twenty-five.

Personally I question whether any man who has taken proper care of himself, and has never injured his system by excesses of any kind, is at his physical best before the age of thirty-five.

As to the specific choice of exercises for the individual during this period of early maturity, the decision may usually be left to the individual himself guided by his natural tastes and capacities. Boxing, wrestling, rowing, fencing, tennis, hand-ball—each is good of its kind, and infinitely better than any system of non-competitive calisthenic or gymnasium exercises. Yet the latter are not to be scorned if the former cannot be had. The time has not yet come, however, at which the individual needs to drive himself to the task of exercising, or pay the penalty of obesity, flabbiness of muscle, and general physical disrepair.

That time approaches, however, as you enter the succeeding period—twenty-five to forty—and it is fully at hand before you reach the close of that period. This is the time of full maturity, when if ever the muscular system is capable of great feats of endurance, to which, nevertheless, the wise man will subject his system as in-frequently as possible. Unless you are a professional athlete, there is no reason why your muscles should ever be put to the supreme test of endurance contests. In boxing or wrestling or rowing or tennis playing, you will as a matter of course exert your full strength on occasion; but only for limited periods, if you are wise, and never to the point of profound exhaustion.

The chief reason why long-drawn-out contests are to be avoided is that they put an excessive strain on the heart, which may lead to permanent dilatation of that organ. We have seen how muscular exertion accelerates the flow of the blood, and brings an added strain on the heart, which must beat faster and harder to relieve itself of the inrushing current. It should be remembered, too, that the free perspiration that accompanies active exertion implies the taking of water from the blood.

I have known a wrestler weighing 140 pounds to lose eight pounds of weight in the course of a single contest.

This implies that the blood is depleted of its watery constituents to an extent that must render it fairly viscid—giving it an almost molasses-like quality that necessarily makes its propulsion through the vascular channels, in particular the capillaries, inordinately difficult. This in itself is a sufficient reason for eschewing prolonged contests. I have already stated that I think that Marathon races and four-mile boat races should be interdicted. I believe also that a two-hour limit should be placed on even professional wrestling contests. For amateur wrestling contests, the fifteen-minute limit usually imposed is a wise restriction.

I repeat that the individual who is exercising for health, with an eye to longevity, should on no account indulge in any contest that is so prolonged as to thicken his blood and carry him to the point of extreme exhaustion. If he violates this rule he does so at the risk of incurring a permanent heart malady.

And what of the man who is passing maturity—he who is entering the forty to fifty year period? A fair answer might be found in the phrase: "The same, only a little more so." There is no reason why the man who has led an athletic life up to this time should not continue to box and wrestle and row and play tennis throughout his forties. But if he is wise he will lay less stress on the competitive element in these parts than he did in the earlier epoch. I am inclined to feel that wrestling is a better exercise than boxing for the man at this period. At wrestling one can gauge the amount of exertion somewhat more in accordance with one's inclination, choosing his own rest periods, and modifying the particular manner of his activities. Properly regulated, wrestling is the ideal exercise for the mature man.

Hand-ball may also be regarded as a nearly ideal recreation for the man at middle age. It has the added merit of being a game equally adapted for women. It is superior to tennis in that it brings both hands into play. It has an added practical advantage in that it is played on a court of moderate size, which may be established in an ordinary gymnasium. There should be a hand-ball court, or series of hand-ball courts, on the roof of every office building in every city.

The man who has passed the half century mark may still play hand-ball, and play it rather strenuously. But he will have learned to substitute skill in "placing" the balls to some extent for violent action; and he will know that he must not hope to compete in celerity of movement with the younger generation. He will select opponents of his own age, and renounce all thought of playing in "championship" form. But he may enjoy the game, nevertheless, and may secure to the full the benefits of exercise that is sufficiently energetic to lead to a profuse perspiration, keeping his entire muscular system, including the heart, in excellent tone; his digestive apparatus in good working order; and his nervous system just sufficiently unstrung.

The man in this over-the-line epoch may still exercise on the wrestling mat, if he can find a proper associate; but he should absolutely interdict the thought of competition for mastery of a younger antagonist. If he cannot wrestle without putting forth supreme efforts, which are likely to overtax the heart, he had better keep off the mat altogether. He is now in an epoch in which the bodily machine is tending to show the effects of wear, and although he may feel as well as ever, and even as strong as ever, he has not the capacity for endurance that he once had. His heart muscles, like his other muscles, are tending to weaken, and a much less degree of strain than they could formerly have endured may be harmful to them. As he is exercising for health and longevity, he must henceforward favor his bodily machine a little, as he would an automobile that has seen its best days. But even at that he may be able to do an amount of work that a man who had not so well cared for himself in earlier years would be quite unable to duplicate. And if he carries out the scheme of exercise with judgment and discretion, he may maintain robust health throughout this period, and finally enter the last lap of the race in a condition that may with propriety be described as "fit."

I know men who have had sixty-five birthdays whom it would be an obvious affront to describe as old. They are sixty-five years *young*.

The remaining years might, perhaps, be characterized as the golf epoch. Doubtless golf is the best of games for the man who has distinctly and unequivocally passed his athletic prime. This is not to say that golf is a game to be scorned by younger persons. It is a good game for men and women of any age. But by itself it scarcely gives adequate exercise to meet the needs of a robust person of early manhood or middle age. It is pre-eminently a game for the old.

The indoor counterpart of golf is billiards; not an athletic game, surely, yet affording an amount of exercise that may be very helpful to the person of frail physique and to the one-time athlete against whom birthdays have been checked in the long series. The man in his eighth decade has muscles of only reminiscent strength and bones that are relatively brittle. He must conserve his energies. The walk across the golf links with an occasional swing at the elusive ball; or the walk about the billiard table with the mild piston-stroke of the cue against the ivory, will afford just the kind of exercise, seasoned with the stimulus of interest, that his superannuated (but not necessarily debilitated) mechanism needs. With these games there may be associated certain calisthenic exercises to meet special needs, and this is equally true of the exercises suited to the individual at any age.

WALKING—THE PERFECT CONSTITUTION BUILDER

By HARRY WELLINGTON

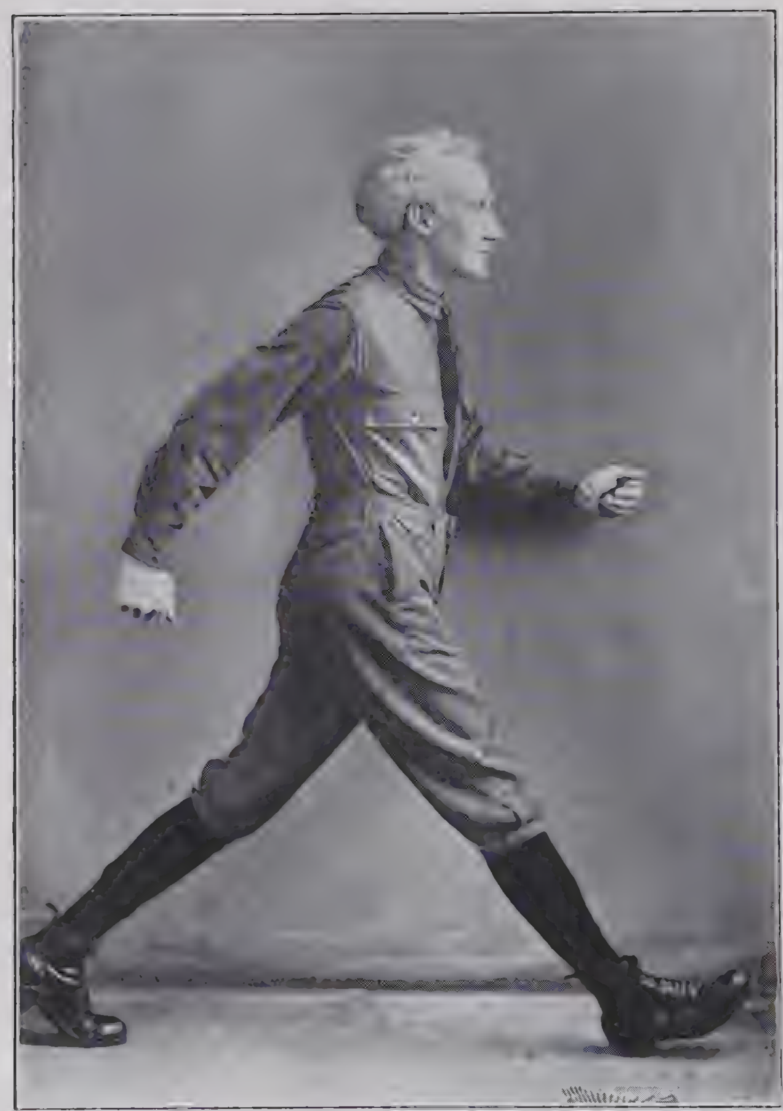
WHAT is the best of all exercises? That's easy. Everybody knows. It is the one form of activity that really keeps alive the millions of men and women who are neither interested in physical culture nor compelled to earn their bread by muscular exertion.

It is quite true that at the present day large numbers of people take their Sunday afternoon walk in an automobile. But there are still a few of us who continue to get along very well on "Adam's express." We put on our "glad rags" and try to make each Sunday afternoon a gentle imitation of the Easter Parade.

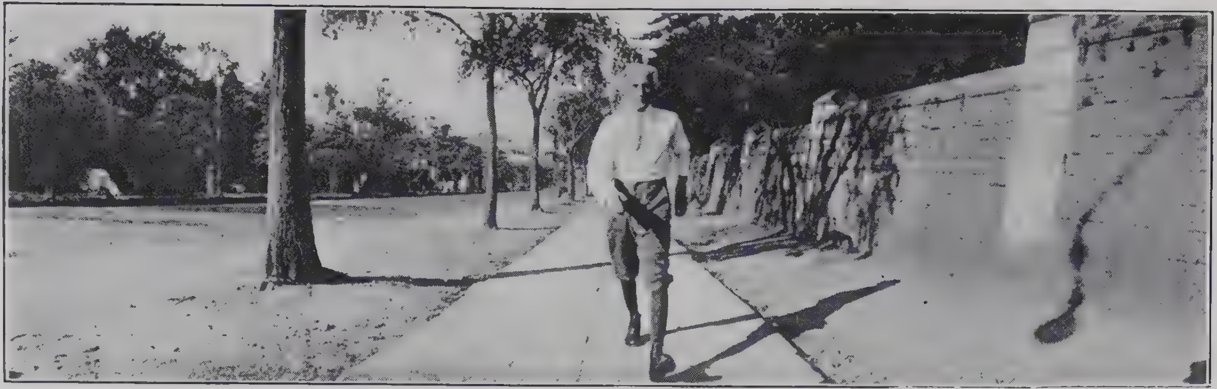
But how do we walk? The truth is that in many cases we do not. We poke. Some of us stroll. Some of us saunter. And many of us simply place one foot in front of the other, alternately, and thus progress gradually in a forward direction. But we do not stride, we do not walk, we do not loosen up—on these tedious Sunday afternoon airings, when we chiefly put on airs.

The real pleasure of walking—the full benefit of walking—cannot be realized except by waking up and stepping out in a manner to make one breathe and to set the blood in active circulation. It is not enough merely to walk. It is the way you do it that counts. Poking along slowly means stagnation of the circulation and the stiffening of the muscles. Next to standing still

WALKING
THE PERFECT CONSTITUTION BUILDER



This photograph of James H. Hocking shows the characteristic heel and toe action with which speed in walking is acquired. The stride is helped by the vigorous forward and backward swing of the arms.



James H. Hocking at the finish of his one-day New York to Philadelphia walk at the age of sixty-three years, covering a distance of 97 miles in 19 hours and 16 minutes. He recently walked from New York to Buffalo, 405 miles, in 6 days and 4 hours, arriving at noon the seventh day. The photo shows the heel and toe stride, the hips swinging with the legs, that is, the left hip swinging forward with the left leg, the right hip with the right leg, and so on, thus adding inches to each stride. This is a "straight knee" gait, the locomotion power being derived from the large gluteal muscles of the hips. This heel and toe action enables one to swing on his way up hill without slackening speed, and with the least hill-climbing effort.

A typical walking club in action. Lovers of walking often find this splendid exercise most enjoyable when undertaken in the company of others. Many cities now have one or more walking clubs. There should be one in your community.

for a long time, there is nothing so fatiguing as slow walking. On returning home instead of feeling invigorated one feels like lying down. If you have walked lazily you will feel more and more lazy.

To enjoy your walk and benefit from it you must develop a stride sufficiently energetic to constitute real exercise, not only for the muscles, but for the internal organs. Your walk should wake you up, not put you to sleep.

It is not necessary to force your pace too much, but you should at least develop a good, free swinging stride that will carry you along in a way to cover the ground, or sidewalk, in such a way that you will have arrived somewhere when you have finished.

Much has been written on the subject of the stride for walking races. For ordinary comfort and pleasure, however, the athletic racing stride is not desirable. At the same time, a modified heel-and-toe action is necessary if you wish to make good time comfortably. In other words, while there should be no exaggeration of the heel-and-toe action, one will do best to feel the weight on the ball of the foot at the proper point in each stride. You will have a more swinging, elastic gait, a more comfortable carriage, and a better walking action if you follow out this idea. And always walk toeing straight forward. Don't turn your toes outward like "ten minutes to two."

The most important point, however, in attaining a comfortable long-distance stride is the knack of swinging the legs forward from the hip. In other words, there should not be too much knee action. If you swing the leg forward from the hip and at the same time swing that hip forward slightly with the leg, you will find that you can to some extent lengthen your stride and attain a much better speed with no more effort. Try it. The action of this stride may be compared with that of a "pacing" horse, as against the high knee action of the "trotter." A little practice in this swinging style of gait will enable you to develop your own peculiar stride, or in other words, that with which you can travel most easily and effectively.

Good posture is, of course, a great advantage in walking. If you will first stretch your arms high above the head, thus raising the chest, you will find yourself well poised, and if you will maintain this position of the trunk of the body, swinging the arms freely at the sides and using the swinging style of stride above mentioned, you will be ready to negotiate distances with the least possible effort and trouble.

Walking is naturally at its best on country roads and dirt paths, not only because of the fresh, pure quality of the air, but because of the natural soft footing of earth. It may be said, however, that when, because of circumstances, one finds occasion to walk distances on stone pavements, the use of the much advertised rubber heels will be of great advantage. They relieve the shock of the heel upon the pavement and establish a condition not unlike that of walking on a dirt path. Rubber heels are being used more and more, not merely because "it pays to advertise," but because they really serve a valuable purpose in this way.

As for the distance to be covered, this depends upon the individual. There is no benefit to be derived from over-exertion. One should be guided by the limits of his vitality and strength. It is better to walk with a fairly vigorous stride for a moderate distance, and thus develop strength, than to walk slowly for a long distance. By walking until slightly tired each day and gradually increasing the distance, one's power of endurance will be increased easily and naturally. The average man or woman, in ordinary health, should in a few weeks acquire the endurance to walk eight or ten miles at a good, free stride without becoming too much fatigued. Of course this is not a long walk, but it is sufficient for ordinary purposes. Even a walk of four or five miles will answer fairly well in the average case.

Cross-continental "hikes" are interesting, but because of the practical requirements of everyday life it is only the leisured few that can indulge in this pleasure. From the health standpoint, however, cross-continental walking has little or no advantage over ordinary hiking in one's own home locality.

The question of walking in company or in solitude is one to be determined by individual inclinations. There are many who most enjoy the privacy of a country walk in which one is left unmolested either to think out his business and personal problems or to enjoy the undisturbed contemplation of the beauties of Nature. Others, again, and probably the majority of people, prefer congenial company. It is for this reason that interest in this delightful exercise is stimulated by the formation of walking clubs. As we know, the health-giving value of any form of physical activity is all the greater when it is more enjoyed.

There should be a walking club in every community.

If there is one in your city or town, it will do you good to join it. If there is not, it is simple enough to organize a group or association for the purpose.

Just what degree of "organization" may be desired will depend largely upon the temperament and inclinations of those interested. There are some people who are natural born "jiners" who like to go through some red tape so that they may feel that they "belong" to something or other.

But it is really not necessary to go to any trouble in the matter of organization. It is a question as to whether the formal or informal type of walking club is the more permanent, but it is certain that neither will outlive the natural interest of the members in the activities and purposes of the organization.

The "Wanderlusters" of Baltimore, Washington, St. Paul and other cities are probably the best examples of walking associations without an iron-clad organization. As a matter of fact, they have never adopted any rules, elected officers or collected membership dues, and their "hikes" are kept up purely through the interest of those participating. The Baltimore Wanderlusters were the first in the field. In the beginning a small group of persons interested had an announcement published in the papers that they were planning to take a Sunday walk, starting from a designated place at a specified hour, and that everyone in town was cordially invited to participate. The idea proved to be an immediate success, and in a short time hundreds of persons turned out for the weekly hike. One of the more active spirits was selected as a "Pathfinder," by general agreement, and different routes were chosen on successive

Sundays. Different persons have at times acted as Pathfinder.

There was some doubt of the success of the plan at first, owing to the fear that some of the rougher elements in the town might spoil the pleasure of the others by their behavior. It was found, however, that a quiet walk of a number of miles through the country, with more or less fatigue at the finish, was not just the kind of diversion that would attract the rowdies, and no trouble of this kind was ever experienced. Those participating in the walks were found to be all good, wholesome people, having the refinement and intelligence to appreciate the advantages and pleasures of walking under such conditions. To a large extent they are lovers of Nature.

So many persons have turned out on some of these walks that they have often been termed "community hikes." It is estimated that fifteen or twenty thousand persons in Washington have, at one time or another during the past two years, participated in these outings. The usual plan is to start at two o'clock in the afternoon from the terminus of some street car line, and the distance covered is from eight to ten miles, practically consuming the rest of the afternoon. Places of historical interest are much chosen for objective points.

In New York City the walking clubs have chiefly taken a somewhat different form. The Metropolitan pedestrians are for the most part organized in athletic clubs having membership in the Amateur Athletic Union, and are intended to promote competition as well as health and recreation. The Walkers' Club of America is regarded as the pioneer of the big organizations in New York City, and has undoubtedly done a great deal for the progress of walking as an American sport. For the past year or more a two-squad system has been in force to suit the requirements of the "veterans" on the one hand and the unseasoned or new members on the other. As a rule the beginners cover a distance of from ten to twelve or fifteen miles, while the other squad continues on to cover a distance of perhaps thirty-five miles. There is also a women's branch.

The other most prominent New York organization is the American Walkers' Association, Inc., "to promote walking for health, recreation and competition," but apparently somewhat less strenuous than the Walkers' Club of America, and more suited to those who simply desire the recreative and pleasurable aspects of the exercise. The distances average a little shorter, being ten, twelve or fifteen miles for the short distance squad, and averaging from twenty to twenty-five miles for the seasoned members, though sometimes covering thirty miles.

Which is the better type of club, that devoted to competition or that intended to promote the recreational and health building features of walking? Which is the better form of activity? No one can settle the question for anyone else. For the full-blooded, athletic young man, it is quite likely that only the competitive form of walking will make a very strong appeal. For others, and undoubtedly the greater number of persons, the "hike" for health" is the thing, with a more moderate pace and greater enjoyment of the beauties of Nature along the way. But certainly there is room for clubs devoted to both kinds of activity in every city. The lad who feels ambitious to smash George Goulding's records, or to walk eight miles an hour, should have an opportunity to try himself out.

"Hikes" are likewise a feature of the activities of the Boy Scouts in many places and also of the Y. M. C. A. Camps for Boys. In the latter camps there is nothing to which the boys look forward more eagerly than a weekly tramp over neighboring hills or mountains, or through woods and valleys, carrying a pack, preparing their own simple meals as they go, and perhaps sleeping in the open with the protection of a good poncho.

There are many mountain-climbing organizations throughout the country, the foremost of these being the Appalachian Mountain Club, with headquarters in Boston, having a membership of nearly two thousand enthusiasts. They have marked many trails with the club's sign, an arrow bearing the initials A. M. C., pointing the way to attractive localities for the hiker. Each year new trails are marked out in the New England mountains. In favorite localities the club has erected camps and cabins which serve as a convenience not only for members, but for other walkers as well. Much interest is shown in mountain climbing in Salt Lake City and along the entire Pacific coast, the clubs for the purpose being almost innumerable. Mountain climbing is simply a more strenuous form of "hiking" and where the topography of the country is such as to provide the opportunity, there is no form of recreation more beneficial or enjoyable.

The difficulties of many of our best militia regiments on hikes of even moderate length have shown that the average citizen is not capable of walking more than ten miles without unusual fatigue. On the other hand, seasoned members of the walking clubs are capable of tramping from thirty to forty miles every day without any ill effects. Fine marksmanship and the best military equipment in the world are of no use to the soldier who cannot march. However, the military argument is unnecessary. If hiking will make better soldiers, it will also make better men and women from every other standpoint.

FRESH AIR AND DEEP BREATHING

By BERNARR MACFADDEN

THERE are very few individuals who realize the value of air. If you walk along the street of the average city during the cool weather and note the closed windows that are to be seen everywhere, you will understand how few know anything of the value of air—how few fully comprehend the importance of oxygen in building and preserving vigorous health. Oxygen is the most important of all food elements. You can go without solid food for weeks—you can go without water for several days, but you cannot live without air for five minutes. There you really have the relative importance of air, water and food. If the average individual does not secure a satisfactory supply of good, pure, nourishing food, he becomes dissatisfied and is likely to acquire the impression that he is starving himself to death; but the same individual can breathe enclosed air over and over again and imbibe in a wholesale way the poisons that result from a habit of this character and yet he will make no complaint.

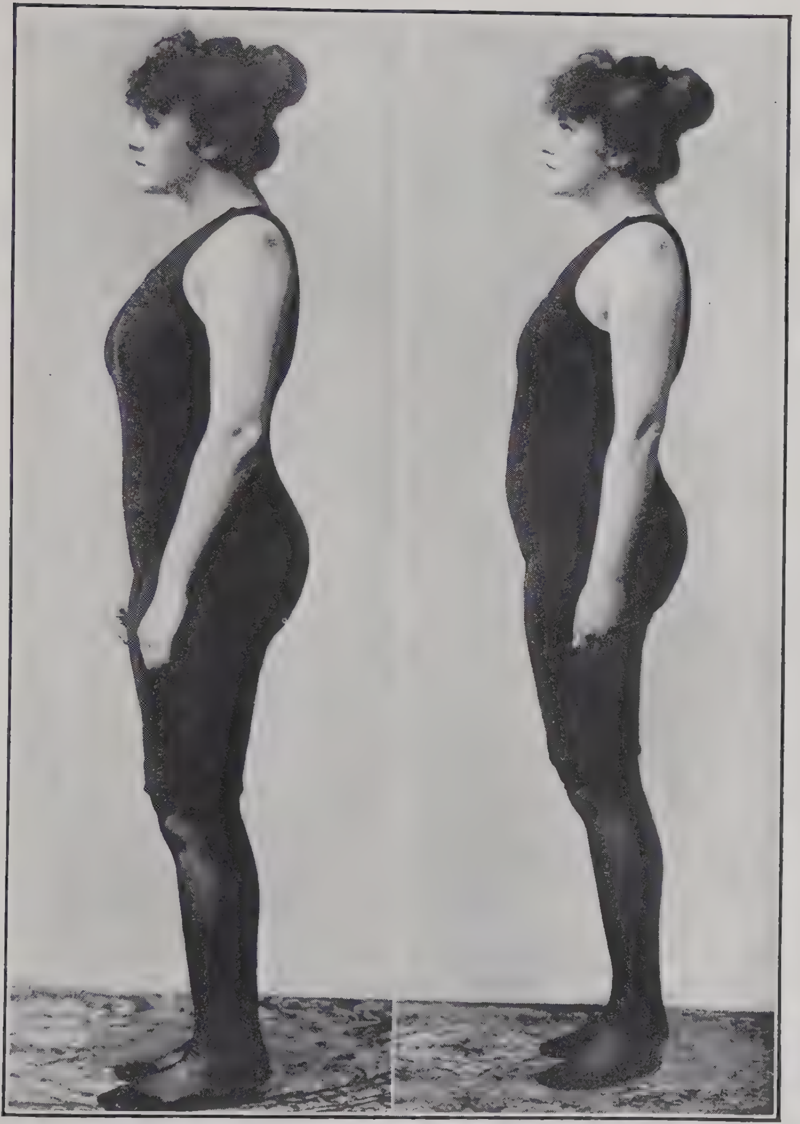
There is a vast amount of mystery connected with the human body, and we still have a great deal to learn. I am very much inclined to accept the theory which has been advanced that with every breath we inhale there is a certain amount of electrical energy, and that the oxygen furnishes this energy in the form of electricity. As the oxygen mingles with this vital fluid, the electricity (human energy) is taken up by the nerves and carried to the nerve centers, where it is stored away in this human powerhouse. You can call it nervous force, electricity, and it is known by other names, but it is this particular force that furnishes the power to carry on the functional and all other processes of the body. It is this power that is used in digesting your food, in running, walking, in performing muscular feats, or even talking. This nervous force is also needed, even for mental work. In fact, more nervous energy is used in mental effort than when one is doing ordinary manual work.

I have often had mental workers say to me, "What is the use of my taking muscular exercise? I do not want big, strong muscles; I do not care to lift heavy weights. I want to reserve all my strength for mental effort." But I am inclined to think that these mental workers are beginning to realize that strength of the body is needed to give one the nervous energy that is required in mental work. The energy that is used by the brain is brought to it by the aid of the nervous forces, and the nervous forces of the body can be increased by building up additional muscular power.

Many years ago, when I first became interested in these subjects, I had the value of fresh air called to my attention. At that time I had what might be called a perpetual cold during the entire winter. I was also very much afraid of lung trouble and was not far from the disease on several occasions. After absorbing a few of the theories as to the value of fresh air, I concluded to open my bedroom windows. I pulled down the windows an inch or two at the top and imagined that I was ventilating my room. At that time I had developed considerable strength, though in the fall I would catch a cold and it would cling to me until the next spring or summer. With that cold I had the hollow, consumptive cough, and I did not free myself absolutely from these symptoms until I really and truly became a fresh air crank—until I learned to open my windows wide—until I fully realized that one really cannot secure too much fresh air, and that it is impossible to absorb more oxygen than one needs. When these important facts were impressed upon me, I pulled down or pushed up my bedroom windows as far as I could.

I know a great many are much afraid of draughts. A draught is nothing but a current of air. Go out of doors on any windy day and you will meet a draught. When you are sleeping in a draught, when the wind is blowing right on you, you may be absolutely certain that you are breathing fresh, pure air—provided, of course, you are not living in a smoky city. If the window is open but slightly, and the air in the room is not stirring, you are likely to breathe the same air two or three times; and when you breathe air more than once you are absorbing poisons—you are breathing a certain amount of carbonic acid gas. You cannot breathe air of that kind and maintain the highest degree of health. You need all the oxygen you can secure. Oxygen builds strength of the highest degree—it is a food of the greatest possible value. No matter what your occupation may be, you should demand good, pure air, and by all means rid yourself of the draught superstition. I know a great many are afraid of draughts. The fear of them has been induced because the average individual has an idea that draught causes a cold. What is a cold? It is nothing more than an endeavor on the part of the functional organism to rid the body of a certain amount of impurities in the form of mucus. If your body is full of impurities and you do not catch a cold, you will probably, at a later period, have a disease much more severe. When there is too much poison in the body, one of the easiest ways of purifying and cleansing it is through the aid of a cold. Never be afraid of a cold; whenever you acquire a complaint of this kind, it is your duty to help the organism eliminate the excess poisons—help the body "clean house."

Very few know anything about breathing. I was professionally engaged in physical training a number of years before I learned the main facts about breathing. For a long time I was impressed with the idea that in order to secure the best results from a deep, full breath, one must draw in the abdominal region all he could while expanding the chest to its full capacity. I was also of the impression that one should hold the abdomen in as much as possible when walking, in order to maintain a proper position of the body, and I had followed this out so carefully that I had actually restricted my lung capacity. After a while I began to notice that my strength was not as great as it had formerly been. On one occasion, about this time, I started on a mile run. I was amazed at the result, for I was tired out before I had reached half the distance, and naturally I was puzzled as to what was the matter. I finally concluded that it might, perhaps, be in the breathing, and instead of trying to see how much I could swell out my chest I began to breathe abdominally, or diaphragmatically,



Showing correct diaphragmatic breathing. The chest walls are held entirely unmoved, the lung expansion being accomplished by downward action of the diaphragm which causes expansion of the body in the abdominal region and around the waist-line. Exhaling causes a flattening or retracting of the abdomen as in the photo at the left, while inhaling causes expansion, as in the photo at the right.

drawing in the breath and expanding the abdominal region. By merely making this change in my breathing I found I could run a mile without tiring in the least. That proved to me beyond all doubt that previously I was not using all my lung power. I was crowding my lungs and not using their full capacity.

Very few men breathe correctly, and women are more at fault in this regard than men. If you want to know how to breathe lay on his back a small child that has never been hampered by restrictive clothing, and then watch him breathe. You will notice that every time he draws in a breath, the abdominal region will rise, and every time he exhales one, the abdominal region will lower. This will give you the basis for a proper method of breathing. When the abdominal region rises, the diaphragm which separates the lungs from the stomach, intestines, etc., goes downward, thus drawing the air downward to the lowest part of the lungs and filling to their fullest capacity every air-cell in the lungs. As the diaphragm goes downward, a certain amount of motion is transmitted to all the important organisms below the diaphragm—the stomach, liver, intestines, etc.—and this small motion induced by proper breathing unquestionably has a very beneficial effect upon the entire digestive process. The process of digestion is carried on much more satisfactorily when you breathe correctly than when you breathe merely from the chest.

Most women are chest-breathers—that is, they breathe from the chest alone. There is practically no evidence of the breathing process in their abdominal region, and this accounts for the small breathing capacity of most women. The breathing capacity of the average woman is usually less than two-thirds of that of the average man. This restricted breathing also accounts to a very large extent for the weakness of the average woman. This statement may seem surprising to many, but the strength of one's body depends very largely upon the lung capacity, and a man or woman with a large breathing capacity is usually far above the average in muscular and nervous strength. Therefore you will find that in every system of health building you are required to give a great deal of attention to what we call deep breathing. Breathing exercises fill the body with oxygen and create human electricity, so that if you give the theory a thorough trial, you cannot doubt the truth of this statement. If you are trying to build the highest degree of attainable strength, you will have to give a great deal of attention to the needs of your body in the matter of oxygen. There are various methods of acquiring the deep-breathing habit. The average individual is a shallow breather—he does not use the full capacity of his lungs, and when he breathes in this manner he cannot develop the human machine to its fullest capacity. Whenever you go into the open air, you should try to acquire the habit of drawing in a deep, full breath, filling the lungs to their greatest capacity and being careful always to expand in the abdominal region first. Thereby the air is drawn down to the lowest part of the lungs, and every air-cell secures the benefit of an increased supply of oxygen. If you form the habit of drawing in the air in this manner every time you go into the open air, you will finally be taking deep breaths unconsciously. A habit of this kind will result in supplying your body with oxygen, with power, in greatly increased quantities. It is only those who follow this rule that know the full meaning of superb, exhilarating health, and when one believes in developing this kind of health, he cannot ignore the requirements of the lungs.

I most emphatically condemn anything that restricts the expansion of the abdominal region, thus interfering with the natural action of the diaphragm. If the abdominal region is restricted, it cannot move outward, and the diaphragm cannot pull the air downward into the lowest part of the lungs. Any restriction of the abdominal region is, therefore, detrimental to health, and yet you hear some women say that a corset cannot injure them. I firmly believe that this restricting device is one of the principal causes of the complaints from which women are everywhere suffering at the present time. You need all the power you can secure to run your human machine. You need energy to digest your food, you need energy even to wink your eye. There is not a single functional process carried on within the body that does not use a certain amount of energy, and if you restrict the capacity of your lungs, you will to a certain extent lessen your manhood and your womanhood.

I believe that the average woman should be nearly as strong as a man. I believe there should be but little difference in the strength of the sexes. You will find that the female among the lower animals is very nearly as strong as the male. Some of our best race horses, for instance, are females. Female gymnasts are as strong and capable as the men, and some of these women attain wonderful strength.

Rhythmic breathing is of very great value. For instance, when you are walking or running, and want to increase your energy, take the same amount of time to draw in your breath as you do to exhale it. If you are walking, inhale your breath during six or eight steps, and then take the same amount of time to exhale it. When you are beginning a walk, it is a good plan to extend the steps as much as possible, always being careful, however, to take the same amount of time to breathe outward as you do to breathe inward. The importance of this suggestion is due to the fact that you empty your lungs and fill them more completely at each breath. After you have walked a while, you will require more air and will have to accelerate your breathing; but I can assure you in advance that you will be able to walk much farther without becoming fatigued than when breathing in the ordinary way. In fact, I have found cases where one has become very much fatigued while walking or running, and by simply adopting the suggestions given herewith the tired feeling disappeared. If you do not believe this statement, try it yourself. I am fully convinced that my success in life has, to a certain extent, been due to proper breathing. Whenever I go into the open air, almost unconsciously I draw in a deep, full inhalation. You cannot do anything in life without energy, and when your body is filled all the time with superabundant power, work of any kind ceases to be a task and becomes a pleasure.

Don't be influenced by the night-air superstition! Night air may not be so full of oxygen as the air which you breathe during the day when the sunlight is permeating it, but it contains all the elements necessary to maintain the highest degree of health, and even if it were possible to shut out the night air, it certainly would not be advisable to shut in a room and breathe over and over again the same air, for then you would simply be breathing poison. Under such circumstances you are bound to rise in the morning with a sleepy and "loggy" feeling, and during the day you will suffer from lack of energy, because at night, when the voluntary powers of the body are at rest and the rebuilding process within the body goes on, you have not normally profited therefrom. The body absorbs new force, new energy, when you breathe good air all night, and you will then awake refreshed, feeling strong and thrilled with new power.

Do not be deceived by the damp-air theory! Damp air is not different from any other air, except that there is a certain amount of moisture held suspended in it. This dampness cannot hurt the lungs any more than water would hurt the stomach when it is required. In large cities where there is a great amount of dust floating around, dampness is in many cases advantageous, because the dust merely sinks to the ground. Damp air cannot harm anyone. A foggy atmosphere may not be as pleasant as the dry air that comes with clear sunlight—it may not have such a vitalizing influence, but there is not a great deal of difference. Foggy air contains a vast amount of oxygen, and breathing it deeply will always bring advantageous results. When the air is full of dust or smoke, the conditions are otherwise. Dust is harmful to the lungs. The same can be said of smoke. When moisture is taken into the lungs, which occurs when the air is damp, it is readily absorbed and can do no harm; but dust or smoke, when inhaled in very great quantities, is bound to interfere with the action of the lungs, and in time is likely to produce disease.

In conclusion let me emphasize the necessity of acquiring the deep-breathing habit. Develop your lungs to their fullest capacity, expand in the abdominal region. Do not wear anything that will restrict this expansion, and whenever you go into the open air from a closed room, be sure to follow my suggestion and fill the lungs to their greatest capacity. If you follow this advice you will soon notice a gradual increase in your strength—you will possess a clearer brain, and there will be far more opportunity for the attainment of life's greatest success.

DIAPHRAGMATIC AND INTERNAL EXERCISE

By THOMAS LLOYD SWIFT

THE most important fact about physical culture is that strength can be cultivated or built. This applies to internal strength as well as to the state of vigor of the large external muscles. We speak of the important large muscles of the body as external only in their relation to the vital centers.

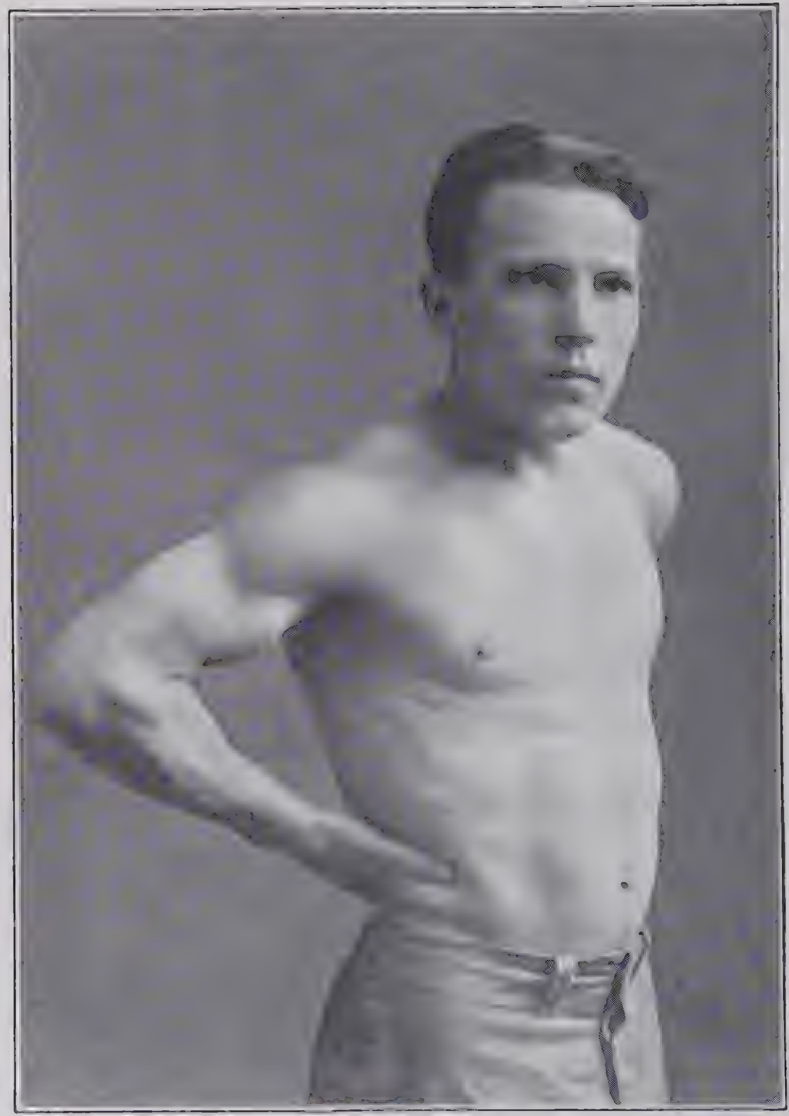
Everyone knows that a person becomes soft, flabby and weak if the muscles are not used. Inactivity or stagnation means loss of tone in the muscles and a weakening of the circulation. But this softness or weakness is even more deplorable where the internal structures are concerned. Fortunately, most forms of muscular exercise, and particularly those which call for endurance, and thereby require prolonged extra work on the part of the internal machinery, have the incidental effect of strengthening and toning up all of the vital organs. Not merely the heart and lungs are put to extra effort, but the liver, kidneys and digestive functions are similarly stimulated.

All of these organs, however, are more immediately affected by special exercises that involve internal muscles. One should remember that the biceps, the leg and back muscles and the others of which we are commonly aware, are not the only muscular structures of the body. The heart is essentially mechanical and muscular in nature. The entire alimentary canal is largely muscular in make-up. Swallowing, for instance, is a purely muscular action. There are tiny muscles in the blood vessels. There are innumerable muscles throughout the body of which one ordinarily is never conscious.

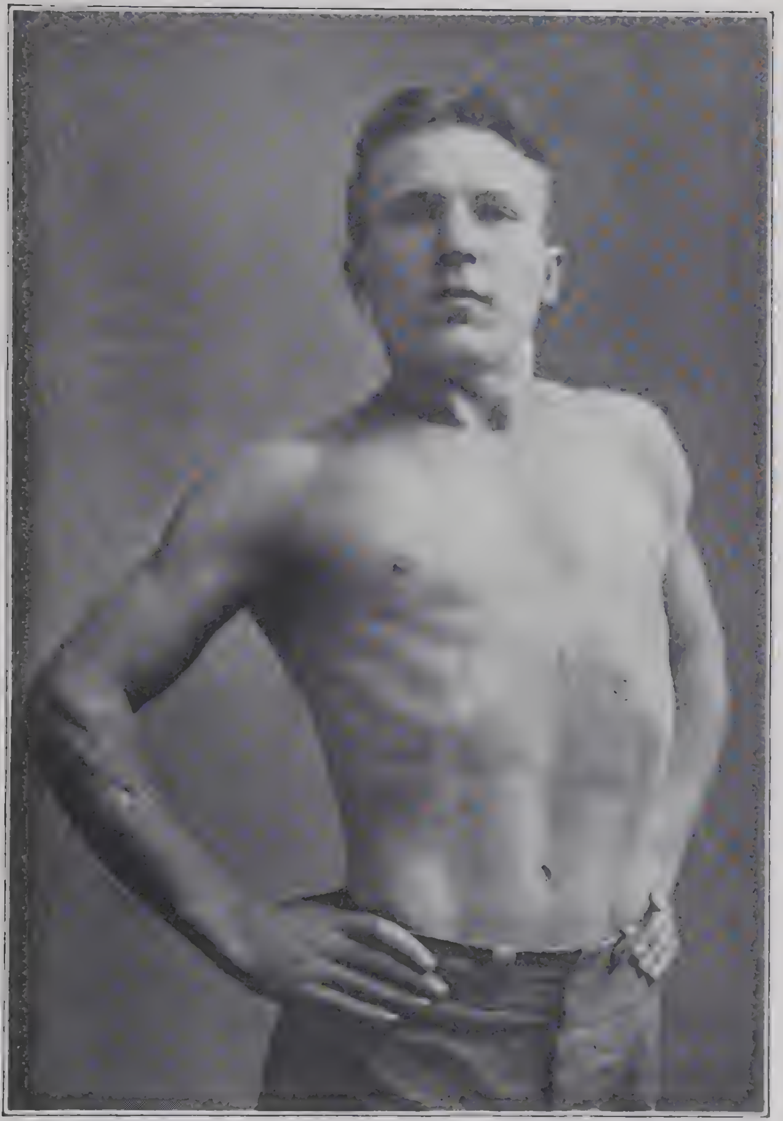
But the most prominent and important of these is the diaphragm. It is a broad, flat, muscular structure something in the form of an inverted bowl. Or you can think of it as a soup plate upside down. It forms the floor of the chest cavity, containing the heart and lungs, and it is also the ceiling or roof of the abdominal cavity, containing the stomach, liver and other viscera. The diaphragm is the chief instrument in breathing. By the contraction of its muscular tissues, the diaphragm is flattened downward, thus enlarging the upstairs room, or chest cavity, and drawing air into the lungs. In other words, breathing is a muscular action depending chiefly or primarily upon the diaphragm, though also upon the chest muscles and upper chest expansion when large quantities of air are needed, as in times of unusual effort.

It is a simple enough matter, therefore, to exercise and strengthen the diaphragm just as one may strengthen and exercise other muscles of the body. You can tense or harden your biceps and you can thereby "feel" the sense of muscular strength and vigor in this large muscle. In the same way you may learn to contract or tense the diaphragm and thereby secure the feeling of muscular strength in this great internal muscle. Indeed, it is possible to cultivate in this muscle a condition of strength in this respect that is perhaps equal to the vigor of the powerful muscles of the arms and legs.

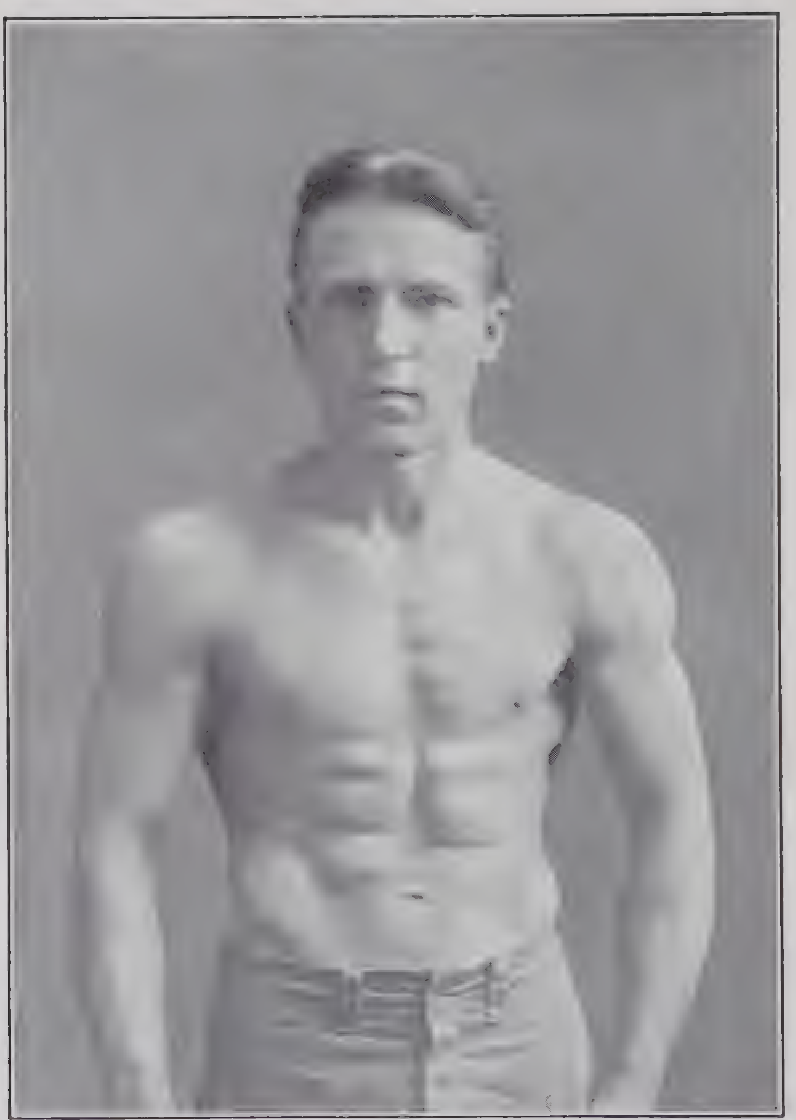
The first step in strengthening the diaphragm is to secure control of it. By exhaling slowly through the almost closed lips, that is, blowing gently, you will develop the muscle sense which will tell you where the diaphragm is. Then blow harder.



To make sure of correct diaphragmatic action in breathing, place your hands at sides and back, as illustrated. You will be able to feel the expansion of the body not merely in the abdominal region but through the back and sides.



Bending slightly backward, inhale and exhale without action of the chest walls, but by diaphragmatic effort only, expanding and contracting in the region of the stomach and waistline.



Following the preceding exercise, bend very slightly forward and contract the muscles of the stomach vigorously. This will involve not only the external muscles, but internally the diaphragm.

The first thing necessary is to learn diaphragmatic breathing. It should really not be necessary for you to learn this, inasmuch as it is natural for everyone to breathe in this manner. That is the way you breathe when you are asleep or otherwise unconscious of your inhalations and exhalations. Nevertheless, in order to gain voluntary control of the diaphragm it may be necessary for you to practice conscious diaphragmatic breathing; that is, the use of the diaphragm under the control of the will. This has often been taught in connection with instructions on deep breathing.

Deep breathing is a splendid habit. One who takes vigorous bodily exercise will naturally be induced to breathe as deeply as necessary through the exercise. Under conditions of inactivity, however, the habit of deep diaphragmatic breathing can be cultivated by consciously inhaling and exhaling a number of times at intervals throughout the day. Having once gained control of the diaphragm through this conscious breathing, so that you can feel its muscular contraction, you can proceed to increase the vigor of these contractions and by this method gradually strengthen internal muscles.

One of the best exercises for the purpose, the first one illustrated, consists in blowing the breath through a small opening in the lips or, in other words, forcing the breath out against resistance. Blowing a cornet would serve the same purpose. Pucker your mouth as in whistling. The smaller the opening in the lips the more vigorous the effort in forcing the breath through it. You will "sense" the element of internal muscular effort, although the external muscles are also involved in blowing.

Another good way to gain control of the diaphragm is found in connection with inhaling the breath. Place the hands on the small of the back with thumbs at the sides, so as to feel the expansion of the body in this region. In proper diaphragmatic breathing the expansion at the waistline is not only noticeable in the abdominal region, but may be felt at the sides and in the back. The entire body at and just above the waistline is enlarged.

When you can keep the upper chest still and feel this expansion at the sides and back while inhaling, you will know that the diaphragm is being put into full action—and that you are breathing diaphragmatically.

It is now a simple matter when inhaling not merely to draw in the breath, but also to contract the diaphragm more vigorously, which gives a bearing-down sensation in the region of the stomach. By continued practice and increased control you can learn to make this contraction very powerful indeed until you experience a sense of great strength in this region.

There is one advantage in taking exercise of this kind in that it can be practiced in the company of others without anyone being the wiser. The exercise is all out of sight—beneath your clothing—and there is not necessarily any movement in the outlines of the body as a whole. The best plan is to go through these simple exercises several times, each at various intervals, during the day, or whenever you think of it. The presence of other people does not matter.

The most simple exercise of expelling the breath forcibly and contracting the diaphragm downward with the inhalation may be attempted as soon as you get a fair degree of muscular control. Then, instead of simply using the downward pressing impulse of the diaphragm, you may make the effort to push forward or outward with the stomach, alternating with the drawing of the stomach inward or backward as far as possible. These exercises will naturally involve the co-operation of the external muscles, but these also should be kept in as vigorous a condition as possible. Firm muscular walls in this region of the body are conducive to internal strength.

In these diaphragm contractions there is involved a considerable amount of massage of the digestive and other organs in the abdominal cavity. The liver is massaged and stimulated, for instance. All parts are "waked up." There is an increase in the circulation, not only of the muscles, but all of the tissues adjacent to these muscles.

CORRECTIVE EXERCISES

By BERNARR MACFADDEN

EXERCISE is valuable not merely for muscular development and strength building, but as a remedial and corrective measure for various bodily defects. The truth is that practically all setting-up exercises are corrective in their influence. The man or woman who takes no special systematic exercise is likely to develop habits of bad posture which tend to become permanent until the body is actually deformed. Even sports and games do not always insure a perfect or symmetrical development. One may engage in baseball and a variety of other games which are beneficial from a strength building or constitutional standpoint and still may remain round shouldered and continue in habits of faulty posture. It is for this reason that systematic exercise intended to straighten and "set up" the body is of value even to the athlete. It is for this reason that sports and athletic games cannot entirely take the place of systematized exercise.

There are a number of conditions, however, which deserve special consideration from the standpoint of corrective gymnastics, such as flatfoot, flat chest, round shoulders, spinal curvature and other forms of deficient development. Probably the better plan of presentation is to consider each of these by itself.

FLATFOOT:

This subject is mentioned first partly because it is a good example of the curative value of specially selected exercise, and partly because of the large percentage of persons suffering from more or less difficulty of this kind. Flatfoot proved to be one of the chief causes for rejection among candidates for army service. In some instances no less than twenty per cent of the rejections for army service were due to flatfoot and weaknesses of the feet.

There is no necessity for flatfoot, even among those who are over-weight. It is curious that the American Indians are practically free from this complaint. Likewise it has been found that the barefoot races, or those using only sandals or moccasins, scarcely know what it means to have flatfoot or any weakness of the feet.

Flatfoot consists in a weakening and breaking down of the arch of the foot, which is composed structurally of a number of small bones held in place by ligaments and muscles. This arch forms a natural spring in the foot. The arch forms chiefly the center and inner side of the foot, the outer edge of the foot being so constructed as to come in contact with the ground along its entire length.

Flatfoot is the result of abuse or wrong use of the feet. The causes are lack of walking, wrong walking, long standing, wrong standing and improper foot gear.

The first and most important exercise for preventing and also for correcting flatfoot consists in walking with the toes pointing straight forward instead of turning outward. The old military drill position of standing with heels together and toes separated at a wide angle is a misuse of the feet. In some modern armies even the standing position at military drill has been changed so that the feet are held parallel with each other, toeing straight forward and a few inches apart. This is ideal, both for standing and walking.

In toeing straight forward when walking, the weight of the body is thrown very largely upon the outer edge of the foot, thus relieving the strain upon the arch which forms the inside edge. In toeing out there is an unusual strain upon this arch. You can demonstrate this in half a minute by walking across the floor both ways in your bare feet. Do not turn the toes in. Simply toe straight ahead. It will then be noticed that in rising upon the ball of the foot, the ankle swings slightly outward. This is characteristic of the normal action. In nearly all cases the mere habit of walking with toes pointed forward and especially placing the weight on the outer edge of the foot will quickly correct any tendency to flatfoot. In addition to this, the exercise while standing of bending the ankle inward, that is to say, raising the inner edge of the foot from the floor and shifting the weight to the outer edge of the feet, is most effective. Also the exercise of rising high upon the toes when the feet are either parallel or the toes slightly turned in will be extremely beneficial. Also the effort of turning the toes downward and doubling the feet inward in a manner corresponding to the doubling of the fist would help greatly in strengthening the muscles and ligaments concerned.

Of course one should first of all secure common sense shoes in which the inside line allows the big toe to point straight forward, and in which there is plenty of room for all the toes. Ask any shoe dealer for his best "common sense" shoe. Artificial arch supports are not necessarily helpful. Sometimes they are detrimental. They act as a crutch and tend to accentuate any weakness. In other cases they act unfavorably by pressure on the weakened parts. If they truly give relief they may be used for a short time until special exercises have strengthened the feet and made them unnecessary.

Long hours of standing upon the feet is, of course, detrimental, especially when toeing out. Walking, however, is always favorable. It strengthens the feet, especially when toeing straight forward. If one must stand for long hours as in the work of a policeman, waiter, shop salesperson or housekeeper, the frequent shifting to the outer edges of the feet, turning the ankles in, and rising upon the toes will relieve the strain and prevent what otherwise might produce a tendency to flatfoot.

Except in the most extreme cases of hopelessly broken down arches, these exercises will bring about a very rapid, complete and permanent cure of flatfoot. In those cases where artificial support seems to be desired, it may often be secured by binding or strapping the feet with wide adhesive plaster.

Spinal Curvature:

A curvature of the spine may be the result of disease, but it is more usually due to faulty posture, and to the muscular weakness which in turn is usually the basis of poor posture. The ideal treatment consists in exercise and correct position in standing, walking, sitting and sleeping. In serious cases mechanical braces may be necessary to support or straighten the back, but the objection to such devices is that through artificial support they still further weaken the muscles of the back. Therefore, even if one uses plaster casts or mechanical braces, he should devote a certain amount of time each day to exercises which strengthen the back muscles, so that in time the artificial supports can be discarded.

Practically all back stretching, back bending, and spine twisting exercises are valuable to restore the spine to its normal lines. The spine stretching movements are especially valuable. In the case of a lateral curvature to one side, the emphasis should be placed upon bending movements that tend to straighten out this curve.

If there is a lateral curvature to the left side, it is well to cultivate the habit of sleeping on the right side so that the very weight of the body would tend to straighten this curve. Sleeping on the left side would tend to aggravate it. In such a case also, in addition to special exercises for the back and for good posture given elsewhere, the frequent practice of stretching the right arm upwards and the left arm downwards will have a valuable corrective influence.

ONE SHOULDER DROOPING:

It is a very common thing to see men and women with one shoulder lower than the other. Sometimes this is even accompanied by the bending of the head a little to one side. This condition is invariably the result of bad position in sitting and standing, sometimes the result of one's occupation. And it is usually accompanied by more or less spinal curvature. For instance, if the right shoulder is lower than the left, it usually goes with a curvature of the spine to the left. In such a case all forms of exercise for the back and shoulders, including stretching movements, and special care in good posture will be necessary. The ideal exercise is the continuous stretching of the right arm and shoulder upward while pulling the left arm and shoulder downward, or vice versa, if the other shoulder is the lower.

Round Shoulders:

This is a very common defect, purely the result of faulty posture. Improperly constructed desks at school and long hours of work at a desk are commonly conducive to this condition. All exercises that tend to bring the shoulders back, or even which tend to raise the arms or the chest, are conducive to an improvement in this condition. The mere injunction, however, to hold the shoulders back is not sufficient, for the root of the evil is more fundamental. It lies in an improper position of the spinal column itself. The upper part of the spine is bent too far forward, or in other words, the dorsal curve is too marked. Exercises for bringing the head back, thereby straightening the spine and raising the chest, will do more in overcoming round shoulders than any exercises for the shoulders themselves. All movements of bringing the arms backward and upward will help, for all such movements are corrective of poor posture.

Flat Chest:

A flat appearance of the chest does not always indicate any structural deficiency, inasmuch as it may be due to poor posture and the bringing forward of the shoulders such as to give the chest a flat appearance. Upon securing a correct military carriage, the same chest no longer appears flat. In other cases, however, there is a real lack of development of the chest itself. The main requirements are deep breathing and posture exercises. A special discussion of exercises for the chest will be found in another section.

PIGEON CHEST:

The condition known as "pigeon chest," sometimes called "chicken breast," is usually a real deformity of the chest produced by the breast-bone projecting too far forward, or by the ribs being attached to it at an angle instead of according to the normal conformation which gives one a satisfactory breadth and roundness of the chest. This is a condition usually overcome without much difficulty, especially in childhood or youth, by the practice of athletic sports. Especially the practice of deep breathing, filling the chest full of air and expanding it as much as possible, many, many times each day for a numbers of years, will so improve this condition that it will eventually give one a normal conformation of the chest. The practice of sleeping on the chest is excellent, tending to press the sternum or breast-bone back into its normal position.

PROMINENT ADAM'S APPLE:

While there is nothing abnormal about the so-called "Adam's apple," which is merely a projection of the upper end of the trachea, or "wind-pipe," containing the larynx and vocal cords, yet in some cases of lack of neck development its prominence is more or less unsightly. A prominent Adam's apple usually goes with a deep bass voice. But all-around exercises for the neck, tending to build up the muscles and other structures of the neck, will so round out the throat as a whole that the Adam's apple no longer appears prominent.

Bow-Legs:

It is very difficult or perhaps impossible to remedy bow-legs after complete growth has been attained, though possibly by persistent pressure applied each day on the outside of the legs some change may be accomplished. A very heroic treatment consists in breaking the bones and straightening out the curve so that upon healing the legs will be straighter, but very few of us desire to have our bones broken purposely, even for such a result.

It is comparatively easy, however, to remedy bow-legs in infancy and childhood, especially if the child is well nourished. The fact is that most cases of bow-legs are due to food deficiency. Many babies become bow-legged upon first learning to walk, but if they are fairly well nourished the bend in the legs will disappear naturally in the process of growth. A bow-legged child of one year may have perfectly straight legs at the age of three or four. If the child suffers from "rickets," due to poor food, however, it would be difficult to overcome this condition even by corrective measures. If the baby has bow-legs the best treatment is to stroke and rub the outer side of each leg, in other words, pressing inward and thus tending to straighten the curve. Too much pressure is not necessary. Moderate stress will accomplish results. Another plan to straighten the legs is to hold the heels together and then press the knees together in this position with the legs straight. It is all very simple.

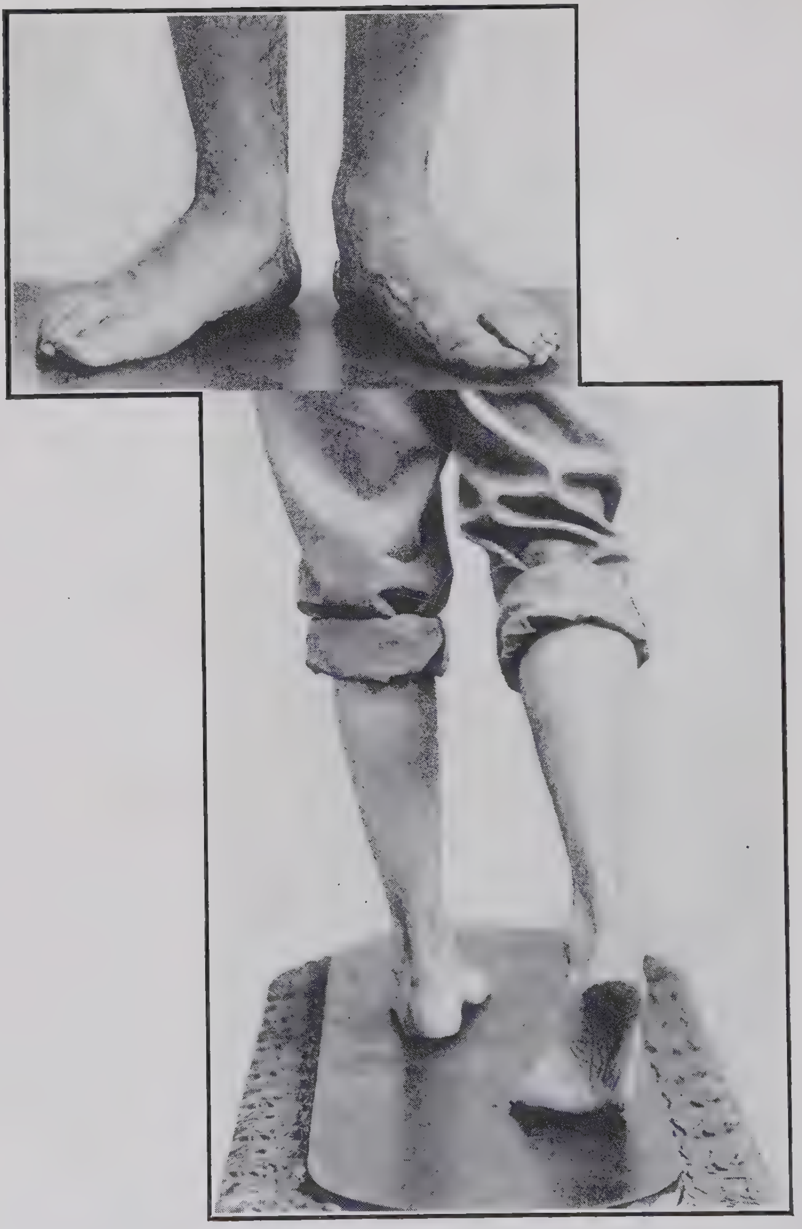
KNOCK-KNEES:

The condition usually known by the name of "knock-knees," in which the lower legs bend outward somewhat from the knees, is just the opposite from bow-legs, except that the bend or defect is chiefly at the knee joint. This is fairly common among women, and it may be said that in a certain measure it is more or less a natural condition among them, due to the different feminine bodily structure. The greater relative breadth of the hips in women makes it inevitable that when the knees are brought together there will be a slight measure of this knock-kneed condition. It is not unbeautiful and should occasion no concern. In an exaggerated case the treatment, which of course is more effective in childhood, consists in pressing the knees outward with the ankles strapped together. One may wedge a pad between the knees in such cases. Also knee-bending movements during which the knees are pressed outward are effective.

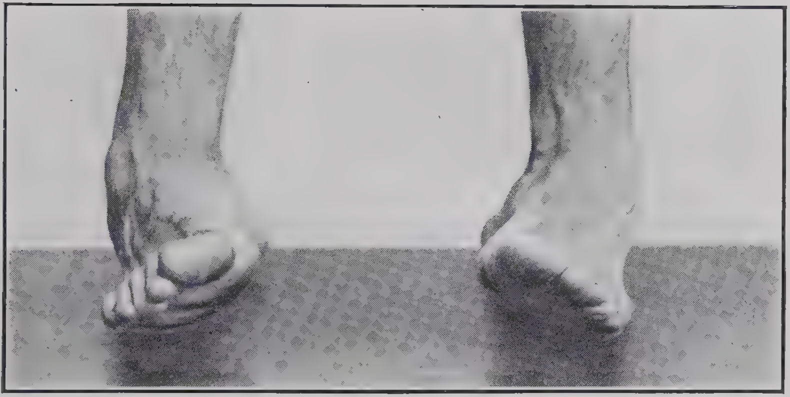
PROTRUDING ABDOMEN:

It will be found that most bodily defects which are not inherited or the result of accident, are due largely to a lack of development. General muscular exercise will always have a corrective influence. For instance, there is a condition, known as Enteroptosis, which involves a sagging down or displacement of the stomach, liver and other organs, crowding the abdominal region and producing a protruding abdomen. Exercises which strengthen the abdominal walls will tend to prevent this, through giving firmness to all the parts. But what is even more important is correct posture. If the body is held erect, the chest normally raised, the abdomen

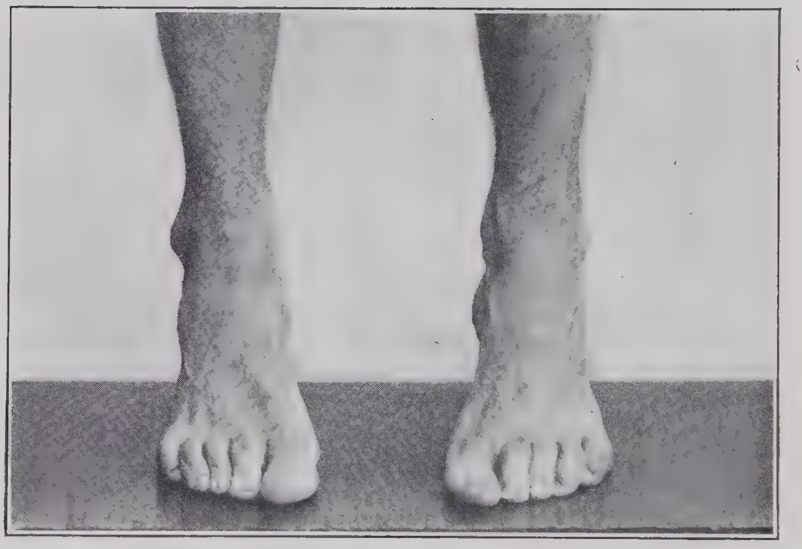
CORRECTIVE EXERCISES
FOR
FLATFOOT



The upper photo shows not only the incorrect position in standing and walking, but also a pair of abnormal feet, showing the breakdown of the arches along the inner edge as a result. The lower photo shows not only correct position in walking, but also a pair of normal feet. Note the strong healthy arches on the inside line of the foot. In this stride the feet are toeing straight forward, but when rising on the toes the heel swings slightly outward, giving it a toeing in appearance.



This is the ideal exercise for the correction of flat foot, shifting the weight of the body from the arch on the inside line to the outer edge of the foot. Practice this movement many times daily.



This exercise of rising on the toes should be performed toeing straight ahead or even toeing slightly inward and preferably shifting the weight to the outer edge of the balls of the foot in doing so.

will be more or less retracted and all of the organs will be carried in their normal position. Under such conditions they can function best. It will be seen, therefore, that both strength of the abdominal muscles and good posture are desirable.

BODILY DEFECTS IN GENERAL:

Practically all ordinary deficiencies can be overcome by persistent exercise. If the calves are too light, concentrated and persistent dancing exercise will build them up. If the ankles are too heavy, active movements such as running, rope skipping, dancing and jumping will be effective in removing the superfluous fatty tissue. The bones cannot be reduced in size.

If the back is weak, exercise will strengthen it.

If the legs become tired through mere standing and walking, more energetic exercise such as running or carrying a load up stairs will so strengthen these muscles that being on one's feet will no longer be sufficient to tire them. Deep knee-bending exercises would be especially recommended.

Exercise for various parts of the body will prove the salvation for thousands of victims of the war in helping them to get control of parts more or less paralyzed or of parts in which wounds have produced partial disablement. Massage and manipulation are not as effective as active exercises, when such can be employed. Cases of this type, however, usually require special consideration at the hands of experts in this line.

STRENGTHENING THE HEART

By BERNARR MACFADDEN

Editor's Note:—The instructions for strengthening the heart given in this chapter are intended only for those who have weak hearts, not for those afflicted with organic disease of the heart. See special chapter on heart disease in Division III. The following applies in cases of tobacco heart, nervous heart and the minor functional disturbances.

IF there is any part or structure of the human body that should be strong, with a plentiful reserve of strength, it is the heart. This is our most vital and important organ. It is this that the hunter, the soldier or the assassin tries to strike with murderous intent. One can not live a moment without the incessant, untiring labor of this strong and faithful servant. But aside from this continuous service, under ordinary conditions of life, it is the heart that has to stand the brunt of all those emergencies and crises in life which call out all of one's powers of resistance.

Not only does the heart bear the heaviest burden in all activities that call for great physical endurance, but also under conditions of extraordinary excitement or mental and emotional strain, such as one sometimes has to face in either personal or business life, it is this central organ that is most severely taxed. It is not only the athlete who needs a strong heart, for the wounded man at the hospital under the influence of an anesthetic, the woman passing the crisis of motherhood, the business man at the climax of his career, or anyone else during the periods of stress and trial, either physical or mental, needs a sound and powerful heart more than anything else.

The need of strength in the heart is shown by the fact that Nature has ordinarily made this organ exceedingly powerful, as it must be suited to its work. Even a so-called "weak heart" is an organ of very remarkable power, for even if not capable of unusual strains, it nevertheless does a prodigious amount of hard, continuous and exacting labor in the ordinary course of a quiet life. Indeed, one would really never grow up if the heart were truly weak.

What is the heart? It is nothing more nor less than a muscular pump, and a double pump at that, containing four chambers and such an arrangement of valves that it is mechanically one of the most perfect pumps ever known. The pumping action is accomplished by means of an energetic contraction of the muscular tissues in its walls, thereby compressing the chambers and forcing the blood out into the arterial system. It contracts or pumps in this way, on the average, seventy times a minute, or one hundred thousand eight hundred times a day, and over thirty-six million times a year. We will write it out in figures if you wish so that you can see what it looks like: 36,000,000 times a year. Your heart is only about the size of your fist, and yet all the blood in your body passes through it in three minutes on the average. The total amount of work done in a single day is equal to lifting one ton one hundred thirty feet high. Just carry a ton of coal upstairs one hundred thirty feet if you wish to understand what this means.

But this is only the ordinary work of a man's heart. Under stress of great physical activity or strain of any other emergency, the demands upon this organ are greatly intensified, or even multiplied, and it is to provide against trouble on these occasions that one should specially prepare himself by strengthening this organ. Strength of the heart is measured not only by length of service, during a healthy, long life, but by quality of service, as shown particularly in the ability to meet all demands without any sense of strain.

But how can the heart be strengthened?

How can any part of the body be strengthened? By exercise of the right kind. It is true that there are cases of general bodily weakness due to continuous over-exertion, in which rest is necessary to restore strength. This rule sometimes applies to the heart as well, but this does not alter the fact that as a general proposition exercise of the right kind affords the one effective means of strengthening this organ.

It is also true that in the case of a weak heart, exercises may be so employed as to be injurious. Some persons refrain from vigorous physical training partly through fear of this result. At least this possibility shows the profound effect of exercise upon this organ. However, granting the danger of this result in some instances, it must be clear that anything which is so powerful in its influence can also be used effectively—if correctly—as a means of strengthening and improving the heart.

One should, therefore, not be too much afraid of properly directed activity. Remember that it is the most incessant activity of childhood that builds up such strength and vigor of the heart that under normal conditions it may be good for one hundred years of uninterrupted service. At least some mild physical activity is absolutely necessary if one wishes to strengthen this organ, for it is truly impossible to secure such results if one is unable to take any exercise whatever. Of course one can not get away from the fact that under any circumstances the heart must keep up its work of circulating the blood, even when the body as a whole is in a state of rest, and so might be said to secure a certain amount of exercise. This work, however, should not be regarded as exercise, for it is only the extra exertion that creates a demand for greater strength and which consequently has the result of building greater strength than we can call exercise. In view of such increased activity, the ordinary work of the heart may even be regarded as rest, for this organ, and one who has engaged in no physical activity of any consequence for a considerable time may even be said to have rested the heart during that period. If this is continued too long, the heart will become weak, just as the body as a whole becomes soft and lacking in tone. In extreme cases, degeneracy of various organs and structures may occur, including the fatty degeneration of the heart, of which we frequently hear.

The extra or increased activity of the heart, which we may regard as exercise for this organ, may be induced now and then by muscular exertion, but also by cold water bathing. In fact, anything which quickens respiration and the heart action may be regarded in this light. Where the heart is weak, however, such methods should be employed with the greatest care. The man or woman with a seriously weakened heart should never attempt a cold plunge or cold shower, owing to the tax upon the circulatory system thus created, but by commencing with sponge baths, using only tepid or cool water, and by very slowly and gradually decreasing the temperature of the water, or adopting a more stimulating form of cold bathing, such as the shower or dip with proper modifications of the temperature, the heart can usually be strengthened in very much the same way it would be improved by carefully selected exercise. Indeed, the best plan would be to combine such a program of cold bathing carefully begun and intelligently carried out, with an appropriate scheme of exercise. If one has the average or normal heart, cold bathing can be taken up in a more effective manner from the very beginning so that marked results may be secured.

The same moderation should be observed in taking up exercise to strengthen the heart, as should likewise be employed in commencing physical training of the body in general. One should not make a sudden change from habitual inactivity to extreme or violent exercise. There should be a gradual increase of activity until one reaches the amount of daily exercise that is best suited to his requirements. Where the heart has been rested for periods and is unaccustomed to any unusual tax, it is not wise to subject it suddenly to any prolonged or violent strain through too strenuous indulgence in athletics or gymnastics. This question of moderation in the beginning and gradual increase of activity is one of the first principles of successful exercise, no matter what part of the body may be concerned.

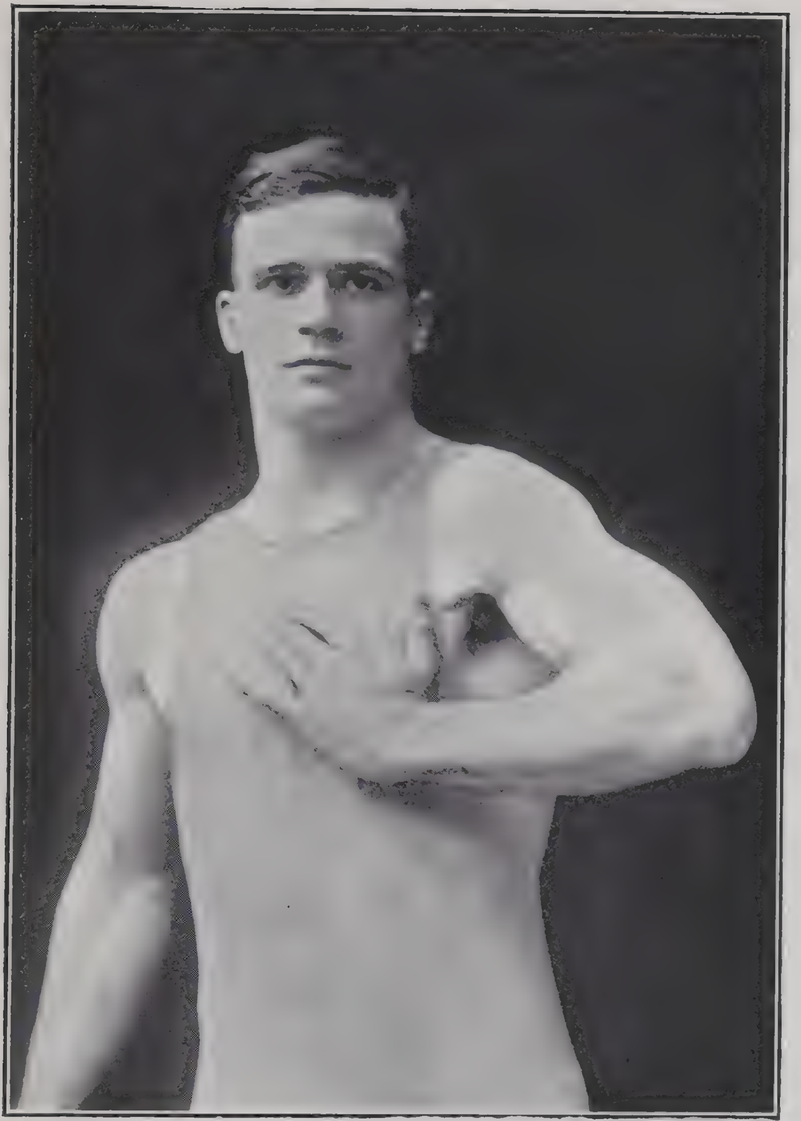
Naturally any muscular exercise for any part of the body, by making increased demands upon the respiration and heart action, constitutes exercise for the heart to a certain extent. Violent muscular effort may create such demands as to strain the heart. The ideal form of exercise for the heart, therefore, consists of some form of light endurance work which calls for only moderate muscular exertion and a moderate increase of the heart's activity, but which, when continued for some little time, has a beneficial effect of permanently strengthening this organ. In other words, what we term constitutional exercise rather than strength-building exercise constitutes the ideal form of training for the strengthening of the heart muscles. I speak of moderate activity because this is suited to the needs of the average man. Extreme strength in the heart is developed by those athletic pastimes which call for endurance in some strenuous activity. Long distance running, therefore, boat racing, wrestling, boxing and highly energetic exercises of this type, developing the maximum of endurance, place the greatest possible demands upon the heart. Weight throwing, involving momentary efforts with intervals of rest, do not build endurance like the sustained exertion of running. It is because of these demands upon the heart that what is known as "athlete's heart" is often developed. It must not be understood that the athletic heart is necessarily a weak heart. In a few instances the athletic heart is also a strained heart, but if this is not the case the athletic heart is simply an enlarged, more muscular and altogether more powerful heart than that of the average man. If the athlete continues to exercise and keeps healthy, instead of suddenly discontinuing, his heart will continue to be healthy.

Naturally these extremes, while not unsuited to well-trained young manhood, are not appropriate for the means of the average man or woman. In such cases, however, endurance work in some moderate form of activity, such as walking, mountain climbing, horseback riding, rowing for pleasure, easy swimming, golf, tennis, dancing, would be admirable for this purpose, though they should never be carried to the extent of extreme fatigue.

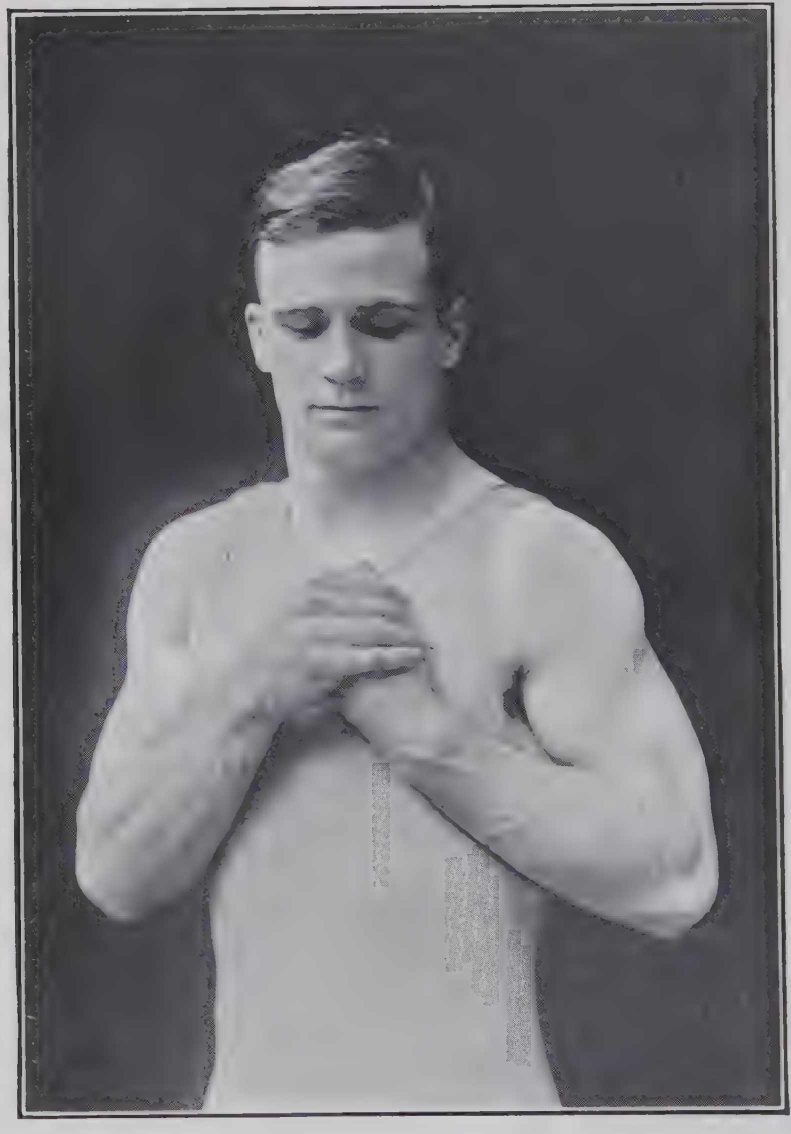
The exercises which I am illustrating are designed to directly strengthen the heart through a form of massage, which is thus applied to it. The comparatively moderate exertion involved in these pressure movements will exercise the heart to a certain degree, but the degree of pressure brought to bear upon this region of the chest at various points will directly invigorate all of the tissues within this part of the chest and naturally the heart in particular. These pressure movements have the advantage that they are suited to the requirements of those who could not undergo any amount of vigorous exercise for the heart. I might say that the same plan of pressure could be adopted to the entire chest, covering the sides and thereby invigorating the lung tissues.

You need have no fear of injuring the heart, not only because it is an elastic muscular structure in itself, but because it is protected to a degree by being placed in a bag containing considerable fatty tissue and consisting of a double layer of membrane which enables it to contract and relax without friction. The pressure applied and relaxed at short intervals will serve the purpose of massage.

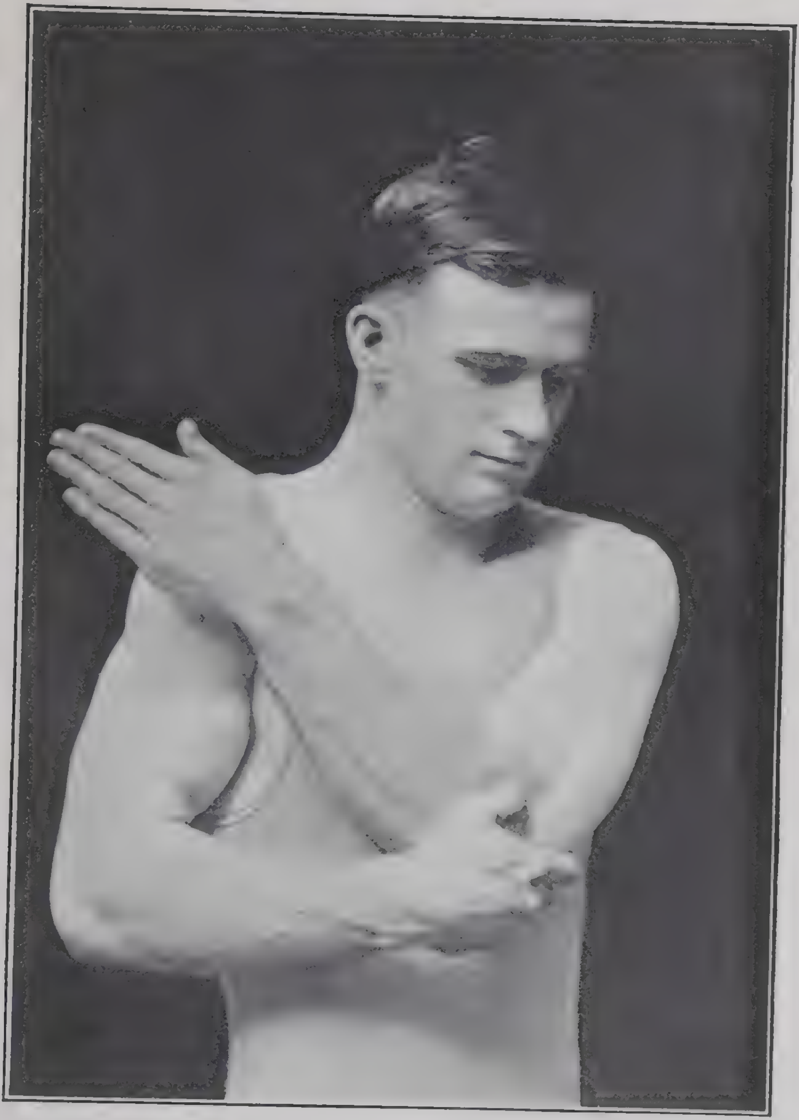
Another effective local treatment for the heart consists in chest expansion exercise. Even though your normal breathing is diaphragmatic, or abdominal, as sometimes called, nevertheless the chest should not be cramped or flattened. There should be plenty of room



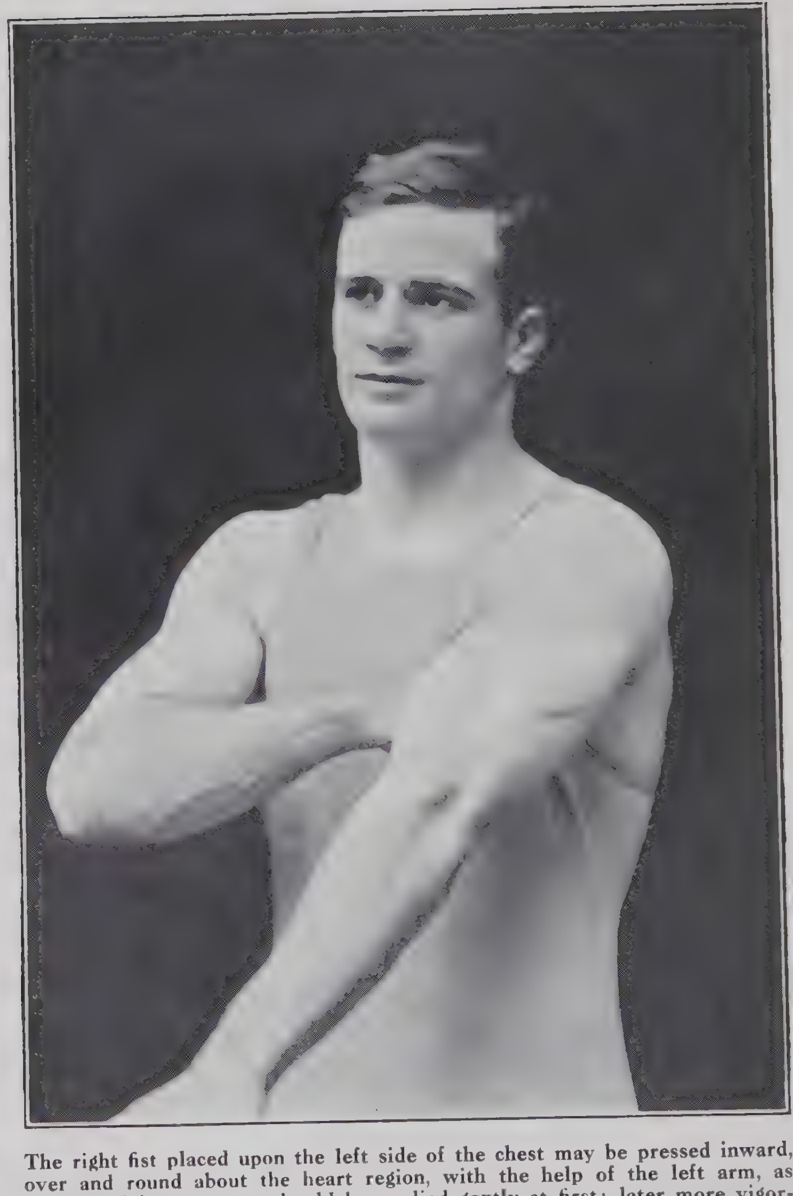
Massage of the heart can be accomplished in practically only one way, and that is by pressure applied at various points upon the chest wall adjacent to the heart. By bringing the elbow forward from the position shown, gentle pressure may be applied.



This is another method of exerting pressure, the left fist being reinforced by the strength of the other hand. With each pressure shift the position of the hand round about the heart region.



This is still another method of massaging the heart through chest pressure. Pressing the upper arm against the left chest with the help of the strenth of the other arm, as illustrated, shift the position upward and downward through a range of several inches.



The right fist placed upon the left side of the chest may be pressed inward, over and round about the heart region, with the help of the left arm, as shown. This treatment should be applied gently at first; later more vigorously.

in the chest for the heart and lungs, and the expansion and contraction, not for breathing, but for the effect upon the heart, offers another form of direct massage of this organ. Of course a good carriage of the body with a normal fullness of the chest naturally means freedom for the heart and is favorable to its welfare.

Another form of moderate exercise for the heart is found in the practice of deep breathing. This breathing exercise may be combined with the chest expansion and contraction means suggested. Breathing exercises naturally increase the supply of blood sent to the lungs, and this involves a degree of accelerated heart action, thus providing mild exercise for this organ. This is especially recommended to those who are not in a condition suited to vigorous physical training. If there is any doubt as to the condition of the heart, it is always wise to have it examined. Remember that in many cases of suspected heart trouble there is nothing wrong with this organ. At the same time, where there is some organic trouble affecting the valves and involving a certain amount of leakage, it is important to avoid any special strain. In such cases it is important to proceed carefully with exercises, although this does not mean that an improvement can not usually be brought about. Remember also that in many cases heart trouble is functional in character or of nervous origin. In this case the building up of the general health and the improvement in the nervous condition will remedy the trouble. A person suffering from heart trouble of nervous origin needs systematic and regular exercise. Tobacco is a common cause of heart trouble and should be carefully avoided.

The most perfect way to rest the heart is not only to avoid muscular exertion, but to lie down. In the horizontal position the heart is relieved from the task of forcing considerable columns of blood upward, as is necessary in the upright or vertical position. When sitting down, furthermore, a measure of rest for the heart is secured by placing the feet upon a footstool or—even better—upon a desk or table. The return of the venous blood, at least so far as the legs are concerned, is then facilitated through the force of gravity. It is not through perverseness, but through instinct, that comfort-seeking persons are inclined to place the feet upon the table. It means real rest for the heart and a measure of relaxation for the limbs. These methods of resting the heart are especially important where there has been any heart strain. In the case of a very weak heart, also, it is sometimes advisable to perform such exercises as may be desirable, in a reclining position. This affords a measure of rest so far as the ordinary work of the heart is concerned, and the exercises performed in that position do not then involve so much of a tax upon the heart.

Naturally any muscular exercise for any part of the body, by making increased demands upon the respiration and heart action, constitutes exercise for the heart to a certain extent. Violent muscular effort may create such demands as to strain the heart. The ideal form of exercise for the heart, therefore, consists of some form of light endurance work which calls for only moderate muscular exertion and a moderate increase of the heart's activity, but which, when continued for some little time, has a beneficial effect of permanently strengthening this organ. In other words, what we term constitutional exercise rather than strength-building exercise constitutes the ideal form of training for the strengthening of the heart muscles. I speak of moderate activity because this is suited to the needs of the average man. Extreme strength in the heart is developed by those athletic pastimes which call for endurance in some strenuous activity. Long distance running, therefore, boat racing, wrestling, boxing and highly energetic exercises of this type, developing the maximum of endurance, place the greatest possible demands upon the heart. Weight throwing, involving momentary efforts with intervals of rest, do not build endurance like the sustained exertion of running. It is because of these demands upon the heart that what is known as "athlete's heart" is often developed. It must not be understood that the athletic heart is necessarily a weak heart. In a few instances the athletic heart is also a strained heart, but if this is not the case, the athletic heart is simply an enlarged, more muscular and altogether more powerful heart than that of the average man. If the athlete continues to exercise and keeps healthy, instead of suddenly discontinuing, his heart will continue to be healthy.

HOW MASSAGE RESTS AND RESTORES

By THORWALD ANDERSON

WHEN father comes in after a hard day's work on the farm, he wants rest.

But how can he rest most quickly, and most completely?

Remember that rest is not simply a negative state, but an extremely positive affair. It is not a mere suspension of activity. It represents a form of very important activity in the sense of rebuilding and recuperating. It is as much a manifestation of life as those other forms of activity which may have made what we call "rest" necessary.

Therefore, it is not sitting down that father most needs to rest him. Likewise it is not sleep.

Even newspaper and slippers will not do much good. What father most needs to relieve him of the fatigue and stiffness following his day's work is massage.

The same about mother. Perhaps she too is all used up after a hard day's work, washing, scrubbing, sweeping, doing dishes, standing on her tired, aching feet, and what-not. What does she need? She needs a little light, fast exercise for one thing, exercise of a corrective nature to counteract the effect of her work in dragging the shoulders forward, cramping the chest and bending the back, after the manner of general housework. A little stimulating exercise under such conditions is refreshing.

But also, for her fatigue, she needs massage. It will rest one probably quicker than anything else that you can imagine, although a warm bath will also do a great deal in the same way. It might be a good plan, if convenient, to take the bath first.

It is in this respect that the athlete is wiser than the worker. It is customary for the athlete to enjoy a thorough "rub down" following his exertions. It is true that the worker does not usually exert himself to the same extent as the athlete, and may not so nearly reach the muscular fatigue limits, but he is often more or less stiffened from his work and he needs the restful effect of massage just the same.

Even when self-applied, massage before retiring is valuable to the physically tired man or woman. Immediately following any great or prolonged exertion, massage is even more important and far more restful than sleep. Perhaps one should not compare the two, for sleep is always an indispensable part of life, but when there is any pronounced degree of muscular fatigue, one has to deal with a condition in which the tissues are choked and stiffened through the presence of accumulated waste material, or "fatigue-poisons." And rest in such a case consists primarily in the relief of this condition through the removal of these poisonous products. To go to sleep under such conditions without the preliminary help of massage is far from conducive to satisfactory recuperation. During sleep the circulation becomes less active, and the task of removing these obstructing waste-poisons from the muscular tissues proceeds very slowly, so that one is likely to awaken without sufficient relief from the sense of stiffness and from the condition of fatigue poisoning which this stiffness indicates.

Massage, on the contrary, has the effect of driving these waste products out of the tissues through the quickened circulation, thereby relieving the stiffness and making it possible to gain far more benefit from the sleep that follows.

But it is not merely muscular fatigue that is relieved in this way. Even in a case of mental fatigue massage is refreshing, for the reason that it causes the poisonous products incident to exhausting brain work to be more quickly oxidized and removed from the body.

It would be going back to the A, B, C's of the subject to show that the immediate effect of massage is to increase the circulation in the tissues, through the kneading and manipulation of the parts. The important point for present consideration lies in the fact that massage has an internally cleansing effect. It is simply in this cleansing process, that is to say, in the removal of the fatigue poisons, that the restful effect of massage is produced. It is this condition of cell cleanliness, tissue cleanliness or freedom from obstructing and poisoning waste products that makes it possible for the muscles, the brain or any other part of the body to function most perfectly. It is only under conditions of this cell cleanliness that a muscle possesses its full strength. As a matter of fact, among athletes it is customary to enjoy a rub down before any strenuous exertion, as well as after, for the reason that the massage accomplishes this very effect of removing any accumulated waste products, overcoming any tendency toward stiffness and leaving the muscles in a supple and favorable condition.

Experiments have shown that after a muscle has been thoroughly fatigued by continuous repetition of a certain movement, a few minutes of massage may so restore its condition that subsequently the same effort may be repeated an even greater number of times. Experiments of this kind have shown very forcibly the value of massage, not only in restoring strength, but in promoting endurance.

One important thing for every physical culturist to learn is that exercise has a restful effect under certain conditions. This refers particularly to light, quick forms of exercise, which are stimulating in character and greatly accelerate the circulation. One who has been doing slow and tedious work of a kind that tends especially to stiffen the muscles will usually find the quickest relief, not in complete rest, but in light, quick exercises. You may be surprised to find how refreshing it may be. Massage is often more perfectly suited to this purpose, and it is the only treatment for great muscular fatigue.

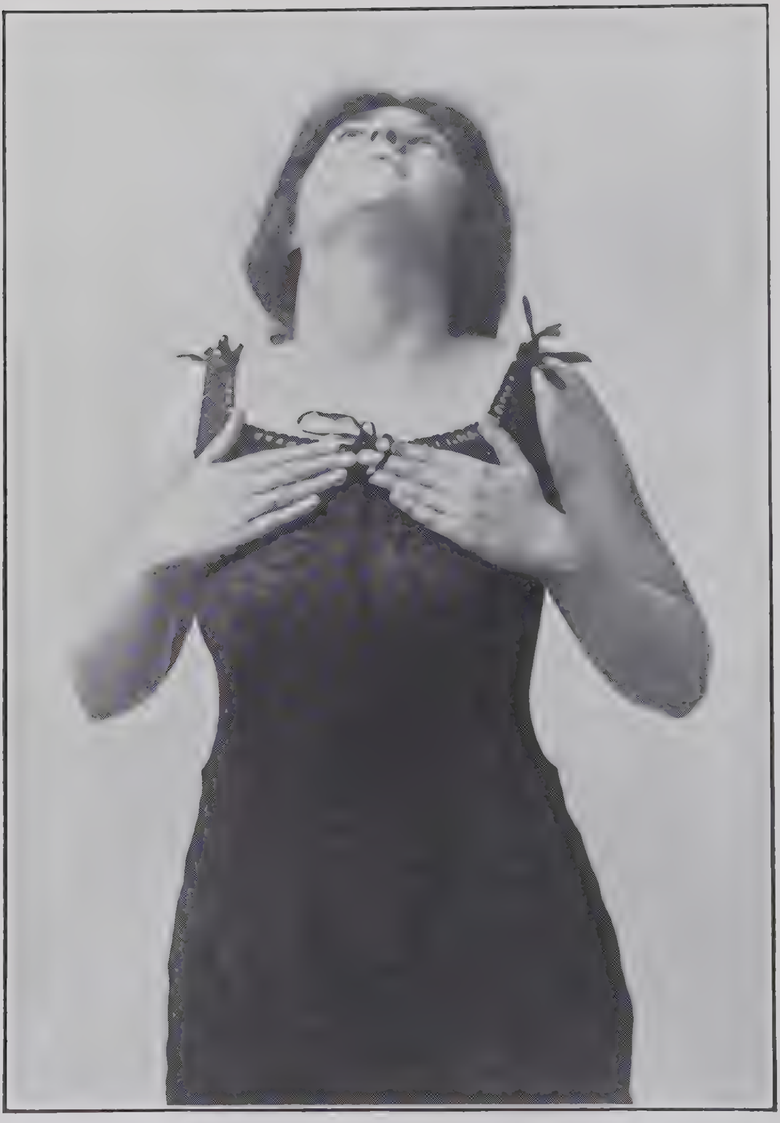
Aside from this, massage may to a certain extent take the place of exercise in one who is convalescent or confined to his bed for any other reason. It promotes active circulation and keeps the tissues healthy. It does not have the positive strength-building value of exercise, but it offers the nearest possible substitute and will not only keep one in good condition, but will help a delicate person to build up healthy tissues. For extremely nervous persons it will often be more advantageous than exercise for this purpose, for the reason that it does not involve any material drain on the nervous forces of the body. Exercise not only calls for activity of the muscles and increases the circulation in them, but it consumes a certain amount of nerve force, and thus tends to exhaust the nerve cells and nerve centers.

Massage, on the other hand, likewise stimulates cell activity and increases circulation in the muscles, but without any drain on the nerve centers. On this account it is of particular value to those suffering from any degree of nervous exhaustion. For those who are anemic, also, it is of very great value as a means of stimulating the formation of new blood cells.

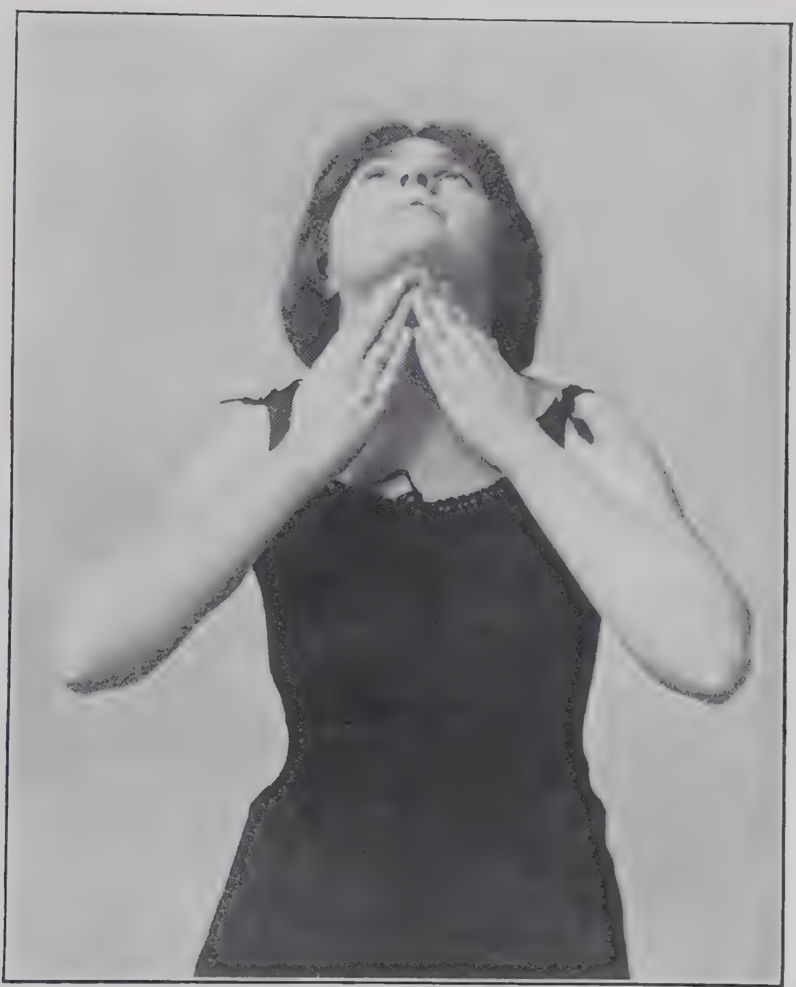
Without going into the details of massage manipulations, it may be said that deep massage has to do chiefly with the muscular structures or the internal organs, producing the restful effect for the former that we have indicated, or stimulating the latter to more vigorous functioning. It is not so well understood, however, that the nervous system is greatly influenced by some forms of massage, most notably those forms of vibration applied to the spine powerfully to stimulate the nerve centers, and also the light stroking or friction treatment of the surface of the body. Light stroking movements have very little effect upon the underlying muscles, but have a very marked influence upon the skin and the connective tissue immediately beneath it. It is this type of massage that is most effective so far as the face is concerned, and in the improvement of the texture of the skin, but it is also precisely this form of massage that is most valuable in its effect upon the nervous system, because of the countless numbers of tiny nerve endings located in the skin.

Anything which affects the surface of the body is inclined to have some influence upon the central nervous system. Various forms of bathing illustrate this principle, as for instance, in the soothing effect of a neutral bath in a case of great mental excitement or mania.

In all massage movements the direction of treatment should be upward or toward the heart. In the arms, for instance, strokes should proceed from the wrists to the shoulders.



This is an example of "friction," a circular movement applied to the trunk of the body, both arms moving in a circular action.



A stroking massage treatment applied to the throat and chin, useful for overcoming double chin in those too stout.

A simple but effective form of deep massage is found in percussion, or "tapotement," often best applied by a chopping action, using the outer edges of the hands, with a flexible wrist movement. Apply gently, never too stiffly.

Light stroking movements over the surface of the body have a similar sedative or nerve quieting effect. Nervous headaches have often been remedied, not through "magnetic healing," but purely through the reflex nervous effect of the light stroking of the forehead. The experienced masseuse, after deep massage of any part of the body, commonly finishes up with a few light strokes over the part. This has a pleasing effect upon the nerves.

The question of the application of massage is one that often offers a problem where an experienced masseuse is not available. The more expert the administration, naturally the more effective and beneficial the treatment. But it is not necessary to be an expert in order to produce material benefit through massage, though it is always well to devote a certain amount of study to the anatomy of the body in order that one may understand just what he is doing, and the manner in which his manipulations will affect the internal parts. For instance, in rubbing, it is well to know that upward strokes upon the limbs, that is to say, toward the heart, are more effective in improving the circulation and relieving fatigue. It is a simple matter, however, for anyone to learn the more simple forms of massage, such as stroking, kneading, circling movements with slight pressure, rolling or twisting upon the limbs, percussion or tapotement, and vibration. For home purposes it is often a good arrangement to have some member of the family specialize in massage for the benefit of the others, possibly for some domestic compensation in the way of other family advantages. On the other hand, it is well in all cases for one to acquaint himself with simple methods of self-application of massage.

Where facial massage is concerned, it is well to remember that mild treatment is more satisfactory than that which is too vigorous or energetic. It is not desirable to place too much stress upon the connective tissues underneath the skin through excessive pulling and stretching. It is simply desirable to improve the circulation.

A similar word of caution is desirable in reference to the application of massage in general. It is neither necessary nor desirable for the operator to apply it with too much strength. Above all things, massage should be comfortable. If it is so vigorously applied that it "hurts," it is more likely to be harmful than beneficial. Moderate kneading and gentle manipulation will be quite effective enough in producing results in the way of improved circulation and increased cell activity, without the abusive treatment of the tissues sometimes indulged in by the amateur under the delusion that through the expenditure of his own strength he is giving just that much "strength" to his victim.

For the surface tissues, the contact should be very light. The square, mechanical type of hand is best for the purpose, being usually firm of grip and well adapted for the work, but anyone who knows how can give massage successfully.

The forms of treatment employed in massage are covered by the following general terms: *Effleurage,* including all stroking movements; *Pétrissage,* involving pressure or kneading movements; *Friction,* or small circular movements; *Tapotement,* covering all tapping or percussion movements. And finally, *vibration,* a form recently become popular.

Effleurage is chiefly intended to affect the skin and superficial tissues, and consists of light, stroking movements with the finger tips. Upon the arms and legs these strokes are upward, and as long as possible. Short strokes are irritating. On neck, chest and back they are downward. The fingers are not lifted on the return, but glide back lightly without losing contact. Effleurage is very soothing to the nerves, and when given lightly is very useful in treating sprains, neuritis and the like, which will not permit of deeper manipulation. Effleurage may also be given with the palm of the hands instead of with the fingers, as on the trunk of the body, or with the thumb and fingers as on the arm. It may also be applied with some pressure, in which case it partakes of the nature of pétrissage. Pétrissage enables one to reach the deeper tissues and is the most valuable form of massage. Chiefly, it consists of kneading, gently but firmly gripping the muscles and other soft tissues. Practically speaking, the tissues are stretched and lifted away from the bone, making them more pliable and elastic, and greatly helping the circulation. The venous blood is forced out of the tissues so that it may be replaced by the fresh arterial blood. There should be a momentary compression only, with an instant of relaxation, then a fresh grip, moving along slightly toward the heart, which, on a limb, means upward. Pétrissage is given with the fingers and thumbs, with fingers and the heel of the hand or ball of the thumb. It is best to have the entire palm in contact when the part of the body treated permits. In handling a limb, both hands are used, one on each side, rolling, squeezing and kneading the tissues.

There are two or three other special forms of pétrissage, what is known as *fulling* being of these the most valuable. This consists of placing the palms of the hands one on each side of a limb, and by rapidly moving them back and forth, as when rubbing the palms together to warm them, imparting a rolling movement to the muscles and tissues. This is very effective on thigh and upper arm. Then there is a *wringing* movement, taking hold as a woman does to wring water out of a cloth, and twisting the tissues, but not too strenuously. *Pincement* is a variety of petrissage intended for the skin and superficial tissues, and consists of lightly pinching and rolling the surface flesh between the thumbs and tips of the fingers.

Friction is a variety of massage that involves pressure, but not the lifting of the tissues characteristic of pétrissage. It consists of a circular movement imparted usually by the thumbs, in small circles, though the tips of the fingers or palm of the hand may be used. The name may be misleading as seeming to indicate friction upon the skin, such as might be expected from stroking or rubbing improperly done, but it really applies to the moderate friction of the tissues under the skin consequent upon the circular movement. These circular manipulations, it must not be forgotten, should be progressive. That is, they should move upward, the circles overlapping each other so that the treatment covers the parts thoroughly. The contact with the skin should be firm, so that there is no slipping over the surface until the hand is moved slightly forward for a new contact. This form is used chiefly on and around the joints, where kneading is not possible, and also wherever the surface tissues are thick and matted or tight. Good on the scalp, for instance, especially where the skin does not move freely over the skull. *Finger kneading* is a sort of combination between friction and pétrissage, moving the tissues in large circles with the pressing tips of the fingers. A similar treatment may be applied with the heel of the hand or the closed fist, as over the abdomen or kidneys.

Tapotement includes all percussion treatments, and is extremely effective in influencing capillary circulation. Care should be used that it is not done too severely. It should be done quickly, using both hands alternately, and with a free, flexible movement of the wrists. It includes slapping, which is done lightly, with the fingers only; the flail, which is very much the same thing done with the back of the fingers; tapping, done with the finger tips, and very useful in treatment of head and chest; hacking or chopping, a more vigorous application done with the ulnar edge of the open hand, just as one would chop meat, very good on the thighs, back and the like; beating, which is similarly done with the ulnar side (opposite the thumb), of the closed fist; and clapping, done with the whole palm of the hand, but with the palms hollowed something like a cup. All of these forms are executed with a movement that is from the wrist only, and are very effective following deep kneading. It is often advantageous, after thorough massage of a part of the body, to wind up with effleurage for a few moments, for its quieting effect, in case there has been any nerve irritation.

Vibration is a form not used in a general massage treatment as a rule, but very useful in reaching internal parts, as in the trunk or neck. Good along the spine. It is applied by placing the fingers upon the body and imparting to them a vibrating or trembling movement, such as that suggested by the hand of a telegrapher, only rapid and steady. The hand must not slip on the skin. A very effective movement is one similar, in which the tissues are grasped and raised from the bone, as it were, and the vibratory motion then imparted.

This form of vibration, administered in this way, is of course a true form of massage. However, vibration of any kind, no matter how imparted, partakes somewhat of the nature of massage, and on this account mechanical vibration instruments, of which there are a number on the market, all have more or less merit and are capable of accomplishing more or less benefit. In some cases this benefit is very marked. Such vibration treatment cannot take the place of a good, thorough massage of the body, but on the other hand, vibration may sometimes reach internal structures that are not easily influenced by hand massage, just as electricity in turn may penetrate to parts which cannot be reached by either massage or mechanical vibration.

There is one virtue in self-massage which is not to be overlooked, namely, the muscular exercise involved in its application. It combines the active and the passive.

Massage in cases of obesity should take the form of pétrissage and pincement entirely, and should be very thorough in this one direction.

Varicose veins, when present, should not be touched directly, but the general circulation through the other veins is improved by massage of the adjacent parts of the limb, and the varicose condition relieved in that manner.

One secures a better contact with the skin if no lubricant is used, but wherever desirable, olive oil or cocoanut butter may be recommended.

The same thing applies to the use of a liquid, such as witch hazel, which is commonly used for the "rub downs" of athletes. Its use is gratifying in the rubbing which follows a hard athletic contest because it is cooling, which is true of any other preparation containing alcohol, or the use of plain alcohol, but it is not necessary for massage.

CAN ONE GROW TALLER?

By BERNARR MACFADDEN

ONE condition which thousands of men and women would like to overcome is that of being too short. Being tall seems to be a very common ideal, even though there is no special advantage in being much above the average height. It only means length of bone, and this of course, means undesirable weight of bone in proportion to the entire body weight. People who are too tall have too much heavy timber to carry. They are not usually as active or capable of action as those of moderate height. Indeed moderate height is far better than being either too tall or too short.

Those who worry about their lack of stature should remember that many of the greatest men in history have been short or of moderate stature, from Napoleon to Lloyd George. In any event, the supreme essential is vitality rather than height. Have you energy? Have you endurance? You may find that you are much better off in this respect than some friend of yours who has excessive length of bone. Tall people usually have long legs, which seldom means that they have better legs. Long-legged people have not even an advantage in running, as is often supposed. A short-legged man can usually out-sprint his lanky competitor.

If you are naturally short it is because you represent short ancestors. Very seldom is one under normal height because of poor feeding or illness. Many sickly persons intended by nature to be tall grow up to be six feet or more, irrespective of health. The thing they lack is not stature, but vigor.

The subject of stature from the standpoint of heredity is based upon Mandelian principles. If your parents are tall you are likely to be tall, but it may still be possible for you to be short if you have had one or two short grandparents, representing families characterized by short stature. You are as likely to take after any one grandparent in this respect as you are to take after one of your own parents. At that, it is all a matter of chance. In a family of ten children having two tall grandparents and two short grandparents, the chances are that five of the children will be short and five tall, though there might of course be a considerable variation of height between the tall and the short in such a family. And that is about all that can be said on the subject from the standpoint of heredity.

In considering the possibility of making one's body taller the first important fact is that the height depends first of all upon the skeleton, or in other words, upon the growth and condition of the bones.

There are really three factors which determine the complete stature of any individual, namely, the length of the legs, the length of the trunk and neck, determined by the length and condition of the spine, and the height of the cranium, which varies materially in different people. As a general thing, great variations in height are chiefly due to the differences in the length of the legs. The length of the spine is more nearly uniform, not often varying very much from the general average of twenty-eight inches; at least there are not such frequent and such marked discrepancies as in the length of the limbs.

In other words, one does not observe the same inequalities of height in a seated group as in the same number of people standing. One who may be utterly shut out of the view of a street parade when standing in a crowd on the sidewalk, might yet be able to see the stage quite perfectly when seated in the theater. Those interested in boxing are only too familiar with the well marked differences in "reach," or length of arm, but the variations in the lower limbs are usually even more marked. It is really a fortunate thing that discrepancies in height are in most cases chiefly due to the latter, inasmuch as it usually leaves the short man in possession of a body trunk which is just as long and as good, and has just as much room for fully developed and vigorous vital organs as his tall friend or competitor. In other words, the short man may have just as much vitality and physical power as the other, or he may even have a great deal more in some instances. Some of the greatest men in the world have been short.

An increase in height between the ages of twenty-two and twenty-six is not the rule, by any means, but if one is below his own normal height, or the height intended for him, when he reached twenty-one or twenty-two, then with good health and proper care of himself he may expect to grow during the next few years. A great many people grow in other respects between the ages of twenty and thirty, broadening out the entire frame, gaining in vitality and strength, particularly in endurance, wearing larger gloves, larger hats and larger collars, all the result of a natural growth and not of fatty accumulations, though the latter are also only too common. One is seldom completely mature physically, certainly not mentally, before the age of thirty years.

Therefore one should take especially good care of himself during this entire third decade of life, which, however, is the very period so often selected for the very wildest of dissipations. The reason why so many people feel that they had so much more vitality during their early youth than at any time after is because they have at that time lavishly and wastefully spent the energy which might have been reserved for the later decades.

Many men shrink in stature from the time of their first flush of youth up to the time of their death. This is not merely the result of the compression of the cartilages of the spine, but of the gradual deformation of the bones themselves. The modification of the lower jaw bone in age is a conspicuous example of this gradual yielding of the bone structure to the stress that is placed upon it. In those of good health and healthful habits the bones are very slow indeed to alter their conformation, while under unfavorable circumstances the deterioration in this respect that should come only with extreme age may be realized early in life. Severe physical strain, continued from day to day, will also have its effect, and we have seen weight-lifting "strong men" decrease in height (in appearance at least), in the course of a few years.

There is no doubt that nutrition and other conditions that affect the general health of the body have much to do with the height, and these influences are particularly important during the formative period of growth, and up to the age of twenty-five years or over. We should strive to follow a thoroughly wholesome diet and thus maintain a well-nourished and vigorous condition of every part of the body. The man whose frame is emaciated, whose cheeks are hollow and colorless, whose muscles are shrunken and wasted, certainly can not hope that his bones are properly nourished and kept in perfect condition. But outdoor life, exercise, sleep and other important vital requirements may be equally as potent as diet in maintaining the resisting power and strength of the bones, and thus also influencing the stature. I emphasize the importance of all these constitutional measures because any attempt to improve the stature by special methods must fail so long as these fundamental influences and requirements of bodily welfare are neglected.

The question of sufficient sleep is particularly important, and deserves emphasis because the habit of staying up late at night is one of the most prevalent and at the same time one of the most destructive of American vices. It is only in sleep that the tissues can recuperate perfectly, and the horizontal position is not only favorable for regaining any shrinking of stature, but absolutely necessary therefor. It is a matter of common knowledge that candidates for police appointments or other desirable positions requiring a certain definite stature, sometimes stay in bed for two or three days previous to their examination in order to stretch out a bit and make a slight temporary gain in height that will enable them to pass. If this is true of a slight temporary gain, it is clear what a positive influence must be found in a sufficient term of sleep each and every night, year in and year out.

A great deal has been said in regard to the compression of the cartilages of the spine, which would thereby tend to shorten the trunk of the body, and there can be no doubt that this is one factor that tends to make many persons shorter than they should normally and properly be, though it must be said that this compression or flattening of the cartilages is largely due to the unfavorable constitutional influences already mentioned, while their improvement will depend in the same way upon more sleep, better nutrition, exercise, open air life and other conditions generally conducive to health. The stretching measures commonly advocated would naturally be of value in this connection, but should not be depended upon without the assistance of the desired constitutional improvements. To put the cartilages of the spine in perfect condition would mean a gain in height, which, though limited, would nevertheless be well worth while. The improvement from this particular source would depend largely upon the question as to what extent the flattening of the cartilages and the general decrepitude of the body are responsible for the lack of height. In a vigorous and very healthy young man, whose spine is in apparently good condition, this may have little or nothing to do with his lack of stature, and in such a case stretching, in itself, would have practically no effect. If it is true that the lack of stature in his case is due to the shortness of the lower limbs, which as we have seen is most frequently the case, while his sitting height is as good as the average, then he need not hope for more than slight improvement through any attention that he may give his backbone. The stretching measures will be of great value in other cases, and particularly in those who have not always enjoyed the most vigorous health, or who may have gone beyond the period of youth.

Very many fail to realize their normal height simply because of improper bodily carriage. By slouching, the spine gradually bends more and more, and this is probably the reason why in some cases an actual growth of the body between the ages of twenty and thirty fails to result in increase in height. Certainly this has much to do with the decline in height as one grows older. By carrying the body erect and getting the spine in proper alignment, one may make a considerable difference in his appearance and an unmistakable increase in stature. This is largely a matter of muscular energy, and, if one is inclined to carelessness in carriage, special attention should be given to strengthening the muscles of the back and to establishing the habit of standing, walking and sitting erect. The extreme military position is not desirable, for the forcible pulling in of the abdomen is unnecessary. The abdomen and waistline should be free, so that diaphragmatic breathing may be carried on freely. But the chest and shoulders should be carried where they belong. A simple movement to correct a slouching carriage is to stretch the arms high over head, bring them down sideways to the side, and then retain the position of the torso thus acquired. This movement may be repeated frequently through the day, either sitting or standing.

Other stretching exercises are valuable by way of improving the stature in all cases where it is below normal, or below that intended by Nature for the individual. They will be useful largely because of their favorable constitutional effect, rather than because of any tendency to stretch the cartilages of the spine, though such stretching will also be very beneficial in many cases. Such exercises should be persisted in faithfully if good results are desired. They will tend to improve the carriage and to strengthen those muscles upon which will depend a permanent improvement in this respect.

Other artificial or mechanical means of stretching the body may be useful, though all around spinal treatment will be specially valuable. Remember, however, that no improvement in height from any of these measures can be expected where the spinal column is already of full length and normal and perfect in every way. And remember, also, the importance of sleep, all around outdoor exercise and a diet that will provide the most perfect nutrition. If there is any deficiency in the latter respect, a fast may be useful to strengthen the digestive organs and improve the assimilative powers, also providing for the building up of new and more healthy tissues in all parts of the body, including bones and cartilages.

THE OLYMPIAN SYSTEM

"Mens sana in corpore sano"

PART ONE

EXERCISE

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EXERCISE FOR WOMEN

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THE FEMALE FORM—IDEAL AND REAL

By L. E. EUBANKS

WERE one to fare forth and ask every woman one met what she should weigh and measure at her height, one wouldn't find one in one hundred who could answer correctly. Some know their height and weight; but few have correct ideas on proper proportion and fewer still appreciate their possibilities and understand the best methods for improvement.

Before taking up "ideal" measurements, it may be interesting to glance at woman as she is—at the *average* as she is found in everyday life.

Some authorities claim that the average American woman is 5 feet 5 inches in height. On the other hand, Dr. Dudley H. Sargent, an eminent authority in such matters, gives 5 feet 2 inches. Personally I think it is not less than 5 feet 3 inches (without shoes), and I should state the other measurements about as follows: Height, seated, 34 inches; neck, 12.5; upper chest, 31.5; waist, 25; arm, extended, 10.3; forearm, 9.2; wrist, 6; hips, 36; thigh, 21; calf, 13.5; weight, nude, 120 pounds; lung capacity, 152 cubic inches.

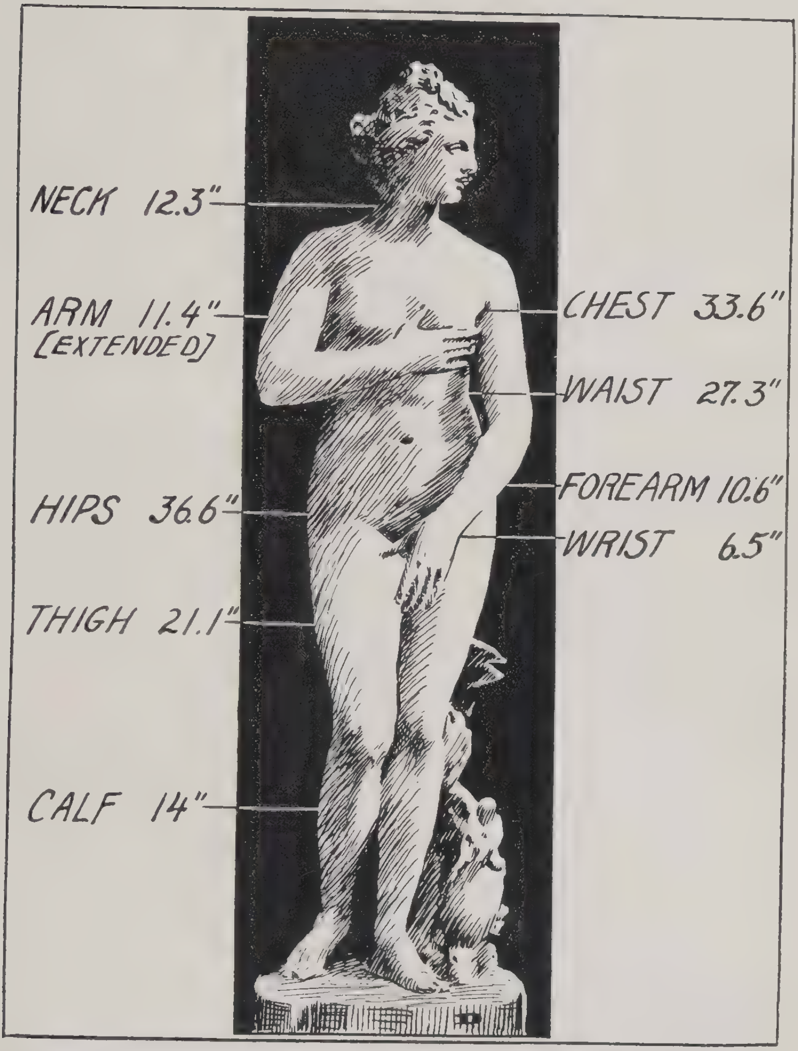
In the University of Washington the following average figures were compiled from the measurements of some 200 "co-eds": Height, 5 feet 3 inches; weight, 121 pounds; breadth of shoulders, 14 inches; breadth of chest, 10.4; breadth of waist, 8.2; breadth of hips, 11.3; depth of chest, 6.9; depth of abdomen, 5.9; girth of chest (lower), 27.6; girth of waist, 25.4.

In strength and endurance the average woman is far below what she should be. I believe the chief reason for this is that she accepts her condition as natural. But such is not the case. Where women are trained, when they step from the beaten track and try to acquire that vigor that Nature intended them to possess—in these cases we see wonderful things accomplished. Compare the ordinary run of women to the circus acrobat or trapeze performer, and then say that women cannot become strong! With rational modes of dress and proper exercise, women make records in athletics that compare very favorably with men's.

Woman is farthest behind her brother in breathing power and waist strength. The average man is a full one hundred cubic inches ahead of the average woman in the lung test, and her strength of back, abdomen and side compares to his even less favorably. In grip power she gains some little, showing an inferiority of only 28 or 29 pounds, and in leg strength she is not so very far behind.

Now to discuss ideal figures. Tastes differ so widely that only basic principles meet general approval. It is agreed that proportion is the first desideratum, and that a figure may be perfect at 5 feet or at 6 feet. Obviously the only unit of value must be drawn from the figure measured; you could not abstract a standard from the measurements of a woman 5 feet 6 inches (however perfect her figure) and apply it to her sister of 5 feet. Thus far painters, sculptors and physical culturists agree.

The unit chosen is the head; the perfectly proportioned woman should stand seven and a half times the



Measurements of the classic Venus de Medici. These proportions are often approached or practically duplicated by women in real life, so that the classical ideal can be identified with feminine perfection in actual life. These proportions, if not these measurements, may apply in the case of a figure from 5 feet 3 inches to 5 feet 7 inches in height. There are, naturally, variations in the length of the lower limbs, arms, torso, neck and head which may, however, not materially affect the circumference measurements indicated on this diagram.

height of her head. Other tests of height, popular but scarcely so well established, are: ten times the length of her face, nine times the length of her hand and from six to seven times the length of her foot. Her arm span should be equal to her height.

But when we get this far opinions begin to diverge. The matter of girths is the bone of contention, and will be as long as there is such a thing as individual taste. Agreement on this would still leave the final question of what particular height is ideal. Only in the light of these qualifying facts and with the understanding that the bony structure must always be considered, can this subject be discussed numerically.

Contrary to general belief, ideally built women do not have extremely tapering lines. Men, ordinarily, are too cylindrical; the waist is too big for the size of the chest, the biceps is not enough larger than the forearm, etc. But too many women have bodies like an inverted cone; the waist, often naturally small and weak, is reduced yet further by the mode of dress, and the bust is allowed to become abnormally large. The hips are generally too big for the thigh and the latter nearly always too big for the calf. To sum up, most women require more muscle in proportion to their fat. Fat literally makes fat, for it prevents radiation—being a poor conductor of heat; so the larger parts of the body continue to gain more rapidly than the smaller ones, finally destroying all proportion. Then we find 24-inch waists with 40-inch busts; 25-inch thighs with 13-inch calves; 14-inch upperarms with 5.5-inch wrists.

Some muscular development is absolutely essential to bodily beauty. Nothing else can produce those desirable curves and give the proper relation of limb to joint. In the fat-burdened leg there is almost no hint of a knee joint between the huge thigh of 25 or 26 inches and the spindling calf of 13. In a well-formed, athletic woman a 13-inch calf would accompany a 20-inch thigh. Compare the two and you will be astonished at the latter's superiority. Similarly, many women are too small in the forearm. Frequently, in cases inclined to fat, we see upper arms, straight, measure three inches more than the forearms. Half that difference would be about correct in average heights.

General opinion places the ideal height for women between 5 feet 3 inches and 5 feet 7 inches. At 5 feet 3 inches the measurements of the Venus de Medici which follow are regarded as perfect: Neck, 12.3 inches; chest, 33.6; waist, 27.3; arm, extended, 11.4; forearm, 10.6; wrist, 6.5; hips, 36.6; thigh, 21.1; calf, 14. This figure is usually termed "small and plump." For 5 feet 7 inches an English authority gives these measurements: Neck, 12 inches; bust, 36; waist, 24.5; upperarm, 11.5; thigh, 22; knee, 15; calf, 14; ankle, 8. This is a decidedly slender type.

I think the beautiful figures of various women whose proportions place them between the types just given indicate that neither extreme is correct. Miss Emma Newkirk, who won *Physical Culture's* contest for the most perfectly formed woman, has a beautiful figure, presenting the following measurements: Height, without shoes, 5 feet 4.5 inches; weight, nude, 136 pounds; neck, 12.5 inches; bust, 35; waist, 25; arm, 10.5; forearm, 9; wrist, 6; hips, 36; thigh, 23.5; calf, 14.5.

Another finely developed woman, one who possesses most remarkable muscular strength, is Miss Minnie Kirbotson, of Leeds, England. Her measurements are: Height, 5 feet 5 inches; neck, 13.75; bust, 37; waist, 27; thigh, 24; calf, 14.5; angle, 8. This woman stands the head test and hand test mentioned above. Also, her arm span and height are equal. Miss Kirbotson's feats with weights certainly refute the old belief that women cannot be strong. Using both hands she lifts to arms' length above the head a barbell of 120 pounds three times; same lift, 90 pounds, twelve times. With right hand or left, 75 pounds, twice; same lift, 50 pounds, eight times.

The measurements of Miss Beatrice Marshall, the famous model, are remarkably good. Height, 5 feet 4 inches; weight, 125 pounds; neck, 13 inches; bust, 34; waist, 25; arm, 10; forearm, 9; wrist, 6.5; hips, 37; thigh, 24; calf, 14.5.

My own opinion, based upon much observation and years of study, is that the perfect woman should stand 5 feet 4 inches, without shoes, and weigh about 130 or 135 pounds, nude; height, seated, 34.5 inches; arm span, 64; neck, 13; bust, 36; waist, 26; biceps (contracted with elbow extended), 12; forearm, 10; wrist, 6; hips, 37; thigh, 23; calf, 14.5; ankle, 8.5; lung capacity, 225 cubic inches.

But the little lady of 5 feet and her tall sister of 5 feet 8 inches rebel against ostracism. Where do we come in? they ask. The chart below is the answer. These figures were prepared after careful examination of the requirements in leading American institutions, and are widely accepted as authoritative. Personally

I do not approve them in every detail, but, on the whole, they are a good guide.

CHART OF IDEAL MEASUREMENTS

Height	Weight	Neck	Chest	Waist	Biceps	Forearm	Wrist	Hips	Thigh	Calf
5 ft.	100	11.5	27	22.75	9.5	7.75	5.5	32.25	19.5	12.25
5 ft. 1 in.	106	11.75	27.25	23	9.75	8	5.5	33	20	12.5
5 ft. 2 in.	112	12	28	23.75	10	8.25	5.75	34	20.75	13
5 ft. 3 in.	118	12.25	28.75	24.5	10.5	8.5	6	35	21.5	13.25
5 ft. 4 in.	125	12.5	29.5	25.25	10.75	8.75	6	36	22.25	13.75
5 ft. 5 in.	132	12.75	30.5	26	11	9	6.25	37	23	14
5 ft. 6 in.	140	13	31.25	26.75	11.5	9.25	6.5	38	24	14.5
5 ft. 7 in.	156	13.25	32.75	28	12	9.5	6.5	40	25	15
5 ft. 8 in.	166	13.5	33.5	29	12.5	9.75	6.75	41	25.5	15.5

HOW WOMAN COMPARES WITH MAN

By CARL EASTON WILLIAMS

IS woman really "the weaker vessel," or is it true that "The female of the species is more deadly than the male," as suggested in Kipling's poem?

Is there any physical basis for the doctrine of sex equality? Or shall we, with a riper judgment, ultimately conclude that the word "equality" is a misleading term, as applied to the respective qualities of men and women? Instead of asking whether the sexes are unequal, would it not be better to ask if they are different, and in what respects? For it is entirely possible for them to be radically different, without either having any basis for the claim of superiority.

At present there are very marked physical distinctions between the two sexes. Every one knows that the men of civilized countries are taller, broader, heavier, and muscularly stronger than the women of the same races. But at once the question arises as to whether or not these differences are fundamental? Are they real, or artificial? To what extent are they the result of the conditions under which women have lived and the narrow limitations of their activities in the past? And again, why does it happen that men are the larger and more powerful? Why not the women? In some species, it is the female that is the stronger. The female eagle is much larger and more powerful than the male. In some forms of insect life the male is insignificant by comparison. As a familiar example, think of the queen bee, and of the drone, who is promptly put to death at the end of his honeymoon. Would it be possible, then, under other conditions of life, different environment, different activities, for women to have developed the larger and stronger bodies? Will the world ever see women of the same height, weight and strength that the men possess?

The truth probably is that the two sexes are evenly balanced. Both originate from the same source, and with the same inherent spark of vitality. But they are specialized in two different directions, men in the direction of muscular power and speed and endurance, and the women in the direction of those qualities which fit them for bearing and rearing children.

From the moment of birth, men have the advantage in size and muscular energy, even if not in vitality. Boy babies are slightly larger at birth, on the average, than girls, and they maintain this lead continuously except for a couple of years about the time of puberty. They are likely to learn to walk earlier, at the age of five years are usually a little taller and heavier than girls, and maintain this lead in growth until about ten years old, but for the next five years the girls grow more rapidly. From about twelve to fifteen years the girls are both heavier and taller. It is a significant fact, however, that even during these two or three years the boys continue to have the advantage in strength and speed. Whether this is the result of the greater devotion of the boys to vigorous games we can not say, though considering other factors it seems unlikely. From the age of fifteen the boys again take the lead, growing most rapidly at or about their sixteenth year. Girls grow more slowly from the fifteenth to the twentieth year, at which time they reach complete growth, or nearly so, while young men continue to grow on an average until the age of twenty-three. At least, this marks the end of active growth, though men usually grow very slowly in strength of bone and tissue, and to a slight extent in bulk, for several years thereafter. The result is that though a man has a marked advantage over a woman at the age of twenty, in stature and muscular energy, he has a much greater advantage over her when he has reached the age of thirty.

An average of many figures indicates that woman is about eight per cent shorter than man. The average weight of the woman of average height is given by modern insurance companies as one hundred and twenty-six pounds. The average weight of the man of average height is one hundred and fifty-three pounds. This difference in weight of twenty-seven pounds seems quite striking, but as a matter of fact it is not as great a difference as would be the case if the weights were apportioned according to the linear measurements. The arithmetically minded reader can figure this out by cubing the height of man and that of woman; he will find that if woman were built in the same proportions as man she would be not twenty-seven but thirty-five pounds lighter, which would make her weight only seventy-seven per cent of man's weight. It may be argued that the height alone is not a fair measurement and that woman should be relatively shorter and thicker than man. This is true if we admit that woman should carry more fatty tissue than man.

In tests of quickness or speed, boys invariably have proven the faster to move. In tests of fatigue, or endurance, a significant fact is to be noted, namely, that while women appear to have exceptional endurance in ordinary work, at what one might term a natural speed, or natural exertion, yet in the case of unusual speed or exertion, they become fatigued much more quickly than men. This is in line with the fact that among savages the men undertake those tasks which call for spurts of violent exertion, and exceptional physical power and speed, with periods of complete rest, while the women are occupied with those labors which call for a more continuous, but less strenuous expenditure of energy. In a word, it seems that women are fitted for those forms of physical exertion which would least interfere with their maternal functions.

It would seem then, that the masculine constitution is specialized for the more strenuous physical tasks, while that of woman is specialized for child-bearing. And that, after all, is the most important work of the world. There is only one bodily measurement in which women exceed men, and that is the girth of the upper thigh. Relatively, women are stronger here than in any other part. And this measurement is affected largely by the structure of the hips. Women are proportionately much larger in the hips, but in the actual measurements men are larger than women. Women's hips are larger only relatively.

But if men have the greater muscular strength, women have the greater hold on life, if that means anything, right from the start. The mortality at birth is much greater among boys. There are more boys born than girls, but their mortality during the first couple of years is also much greater. The mortality is about the same from the third year to the thirty-fifth, and from that time on women have altogether the best of it. Many more of them reach an extreme old age. They are not so much subject to degenerative diseases of the arteries, and they do not so often die suddenly.

It is not to be forgotten that among some savage races the women seem to be muscularly as powerful as the men, and in some cases average the same size. This has been found to be the case among the Patagonians, the Pueblo Indians, and some races of India. The Guiana Indian women, in South America, have often been noted as apparently as strong as their "lords and masters." Among the Andombies on the Congo, some of the Papuans, and in a few other cases, the women have been said to be even stronger than men. This result, however, often seems to be brought about by the special training of the women in their work, particularly where they serve as burden bearers, carrying very heavy loads, while the men live in comparative idleness. However, it must be said that among these savage races the anatomical distinctions between the sexes are not nearly so marked as in the cultured races. As we have already said, sex seems to be a less influential factor in the lower animals. The men and women of the lower human races actually look much alike. Viewed from the rear, it is often difficult to tell whether a figure is male or female. The savage women generally have narrower hips, even approximating those of the men, whereas the broad pelvis and the conspicuous hips of the civilized woman are a pronounced feminine characteristic. The broad pelvis is the mark of the higher human evolution.

Altogether, the further evolution of the human race seems to promise, not that the two sexes will become physically more and more like each other, but that they will become even more distinctive, if anything, in certain respects. This does not mean that one will be superior to the other, but that there will be, if anything, even more difference. The pelvis, again, for instance, which is bound to be a vital factor in the further evolution of the human race, because of its relation to the birth of infants with larger heads, will probably tend to become even broader than it is. A fair proportion of still-born children are those with exceptionally large brain development.

At any rate, irrespective of the stature and strength of primitive women, and of those to come, there is no doubt that the women of today are at a disadvantage in the matter of size and muscular power. But that they are at a disadvantage in the matter of vital qualities does not follow.

We have noted the precocity of growth in women, as a result of which they reach puberty a little sooner than men, and finally attain their complete growth much earlier. This would seem to be a provision for the conserving of vitality, which in the case of men is expended in the continued growth of bone and muscle, this vitality then serving the woman through her childbearing period, with all of the demands then made upon her constitution. We have also noted her greater susceptibility to fatigue when put to the exceptional use of muscular energy, but this also would seem to be a provision for guarding against too great a drain upon her reserve of vitality. At the same time, she has a greater resistance to disease, generally speaking.

In a word, there is compensation for woman for the smaller stature which she is given. It is the gift of maternity, and for this she pays the price of lesser muscular bulk and power. But it is a price that she can well afford to pay. The only question that arises is whether or not she pays too much. The civilized woman seems to pay a price out of proportion, but probably it only seems so. The extremes of weakness that we see on every side certainly do not represent the price she pays for being a woman. These extremes are merely the natural result of her inactive and unhygienic life. She should pay the price of maternity only to the extent that Nature decrees. But in any case this price should never include sickness, if she lives a life that will raise her to a vigorous physical standard.

For another thing, the burden of excessive maternity promises soon to be a thing of the past. Instead of bearing twenty children, most of them to die off, the future mother will bear two to four, all of whom will live. This change will probably mean much in the way of strength. As a matter of fact, women are improving physically. They are living a broader life and a healthier life, they are building up their bodies and learning how to realize their possibilities. Of late years women have been getting out of the home into the broader industrial world. The question is, here, as to whether this fact of men and women working together in the industrial world will ultimately tend to produce men and women whose physical characteristics are more or less similar to each other? Or are these distinctions the inevitable outgrowth of the fact of sex?

There is no question that lack of exercise, a restricted sphere of life, idiotic fashions and errors in dress generally, indoor life and many other factors have been instrumental in making women disproportionately weak. The extreme of frailty is certainly not a sex characteristic. Given the same opportunities as men, the same indulgence in sports and outdoor life, woman will undoubtedly cease to be the very fragile thing which she has come to be regarded. She will become healthy, normal, vigorous. But even at her best she will not attain the muscular bulk and stature of men, and this physical limitation, it would seem, is a definite sex characteristic.

The probability is that when one attempts to ascribe the physical differences of men and women to the influences of the labors and environments of each in the past, he is inclined to forget the profound influence of sex, which becomes more and more marked as organisms rise in the scale of life.

EXERCISE FOR WOMEN—WHY AND HOW

By DOROTHY PEARL BUCHANAN

MILLIONS of women in this country, young women, middle-aged women and old women, get considerable exercise with a broom every day of their lives.

But what kind of exercise?

A great proportion of women are prepared to tell us that not only through the use of the broom, but in many other ways, they find a great deal of exercise in their housework. But again, what kind of exercise?

The truth is that many millions of these same women who do plenty of housework each day are anything but inspiring examples of the possibilities of physical culture.

Every once in a while some newspaper writer who specializes on advice to the lovesick and other similarly inspiring topics, breaks into print with the statement that housework is the best possible exercise for women. If this were true, ninety-eight out of every hundred women in your town would have figures the beauty and symmetry of which would either equal or surpass that of Annette Kellermann herself.

In reality, the deficiencies in the way of bodily beauty of the great majority of women, and particularly of houseworkers, present a condition that is as needless and scandalous as the tremendous percentage of physical defectiveness among the men who applied for service in the army and navy. The fact is that as a rule the longer a woman has done housework and the more of it she has done the worse she looks. Obviously, then, housework is not true physical culture.

There is a fundamental difference between work and exercise, even though there are certain varieties of work which constitute ideal exercise, and even though too much exercise or too much of one kind of exercise may take the form of work.

Work carried to a certain point tends to build and maintain a certain amount of strength. Beyond that point it is exhausting. Exercise is far more effective for building the body and developing strength because it is especially designed for the purpose and, within proper limits, is refreshing and invigorating instead of exhausting. It tones one up and gives increased energy instead of consuming it.

Work commonly overtaxes certain muscles or groups of muscles while neglecting others. Exercise brings into play the neglected muscles, correcting any special weaknesses or defects and giving the entire body a uniform development of strength and symmetry.

Exercise promotes the flexibility of the spine and of all parts of the body, raising the chest, improving the carriage and imparting tone and vigor to internal as well as external parts. Work, on the contrary, is usually conducive to poor bodily posture, with stiffness and rigidity of all parts, and this particularly applies in the case of housework. Nearly all of the physical activities of housekeeping are of a nature to bend the back, drag the shoulders forward, cramp the chest and give one that drooping, tired out appearance that immediately suggests the need of something in the nature of "setting up exercise."

Now it is true that so far as the use of a broom is concerned, ordinary sweeping provides a certain amount of exercise that is far better than no exercise at all. For instance, any woman who has experienced the physical degeneration incident to years of an easy and stagnant life, avoiding physical activity of any kind whatever, and who has therefore grown stout and soft, will be benefited by effort of any kind—even vigorous sweeping with an ordinary broom. For in such cases even poor exercise is better than no activity at all. And this is why housework, with all its failings from the physical culture standpoint, may be recommended to large numbers of women.

But, from the standpoint of true body building, and especially from the standpoint of the corrective influence of systematized physical training, sweeping and other forms of housework represent a miserable substitute for real exercise. The muscular activity is limited in form. It is of a nature to cramp rather than to expand the chest and is productive of such clouds of dust in the atmosphere and ultimately such deposits in the lungs as to offset any possible benefit from the muscular exertion.

The more action one is able to put into his or her exercises, whether in free movements or in any other form of training, the greater the benefit. No movement should be performed in a half-hearted way. Each movement should be done with a pronounced stretch of the muscles involved and with the expression of as much energy as may be justified by the type of exercises involved. Five repetitions of any movement executed with energy and spirit would be more effective than twenty-five repetitions performed in a perfunctory manner.

For purposes of exercise, an ordinary bathing suit is usually ideal if one must wear anything. The body should have complete freedom for every possible movement, bending or stretching.

As to the kind of exercise needed by women, it may be said that almost any type of general body building exercise is suitable for either sex. At the same time, since massive muscular strength is not a natural characteristic of womankind, it follows that the best type of exercise for women is not that which is conducive merely to the building of unusual muscular strength.

Inasmuch as grace of movement is a natural characteristic of womankind, harmonizing with the greater inherent beauty of the sex and the flexibility or elasticity of body which is especially desirable, it follows that exercises conducive to these results are to be preferred.

Next to health and strength, grace is one of the most important of physical characteristics. This, not merely because it makes one's movements more agreeable to those who behold them, but because it promotes activity and strength with only a pleasurable and helpful expenditure of physical energy. The awkward man or woman often puts into a task requiring no effort a degree of physical exertion that should enable one to perform twice the same amount of work.

Nearly all wholesome physical exercises, properly performed, tend to develop grace in the individual. But dancing tends to bring about this result far more effectively than do most forms of exercise, and has also the advantage of providing an agreeable amount of diversion while effecting physical improvement. While exercise lacking diversion may be just as effective in its results, the tendency to favor those forms of exercise that are diverting as well as helpful, is well known and readily explicable.

Now competitive exercises make a strong appeal to many who could not be induced to engage in ordinary forms of exercise merely intended to improve or develop the physique. This is also true of class gymnastics. The social element and certain of the most marked impulses of man, tend to make such forms of exercise popular and effective.

But none of such forms of exercise provide the marked tendency to develop grace that does dancing.

Dancing is primarily a light, graceful and helpful form of physical exercise. It is an excellent thing to master the intricacies and the various steps of each dance so that its performance will afford pleasure to spectators, but this is secondary to the physical benefits that one is to acquire through the dancing. It is not essential that one acquire the most intricate steps and the involved technique that exceptionally skilled exponents of certain dances sometimes exhibit.

This is particularly true of some of the more vigorous folk dances that have developed and survived in many nations because their performance involves a degree of strength and activity. It is the athletic aspects of such dances in which we are interested so far as this discussion goes.

Folk dances have not the formal character of our ordinary forms of social dances. They are more vigorous and require more sustained effort.

Can one conceive a more striking or compelling form of exercise than that of a group of skillful folk dancers performing with skill and with vigor, the evolutions and steps that make up their native forms of folk dances with bodies full of grace and fire, rhythmically swinging through the curious, strenuous and sometimes fascinating movements of the dance?

The dances favored by nations who have developed characteristic forms of folk dancing are made up in great part of movements that have a marked athletic significance, and that actually involve muscular effort. It is these particular movements that render certain folk dances especially enjoyable and beneficial—to say nothing of the vigor that is lent to them by such movements, and that consequently make the dance attractive to the spectator.

The Highland Fling, a dance in high favor among the hardy Highlanders and the people of Scotland in general, is a dance that involves movements demanding exceptionally vigorous physical work.

The Sailor's Hornpipe is another dance well known and not difficult of performance that contains a number of vigorous steps of an athletic nature, but that tend to promote grace. By selecting a few of the most useful movements of this dance, one can attain many athletic and grace building exercises.

Of late years Russian folk dances have become very popular. This particular sort of dance is an especially useful method of acquiring physical strength and endurance, and while at the outset it may appear more difficult than other forms of dancing, it will well repay one for the time one may expend in mastering its intricacies and will develop the strength and endurance essential to its accomplishment.

In many instances it will be far more convenient and just as helpful to select a few movements from a dance that may be depended upon for producing a marked degree of physical development, and for the body in general—even though so situated that it is impossible to find a single companion to become interested in dancing. These movements may then be performed as exercises, rather than as steps of the dance, and one can obtain all of the benefit that the dance will afford, minus the social diversion only.

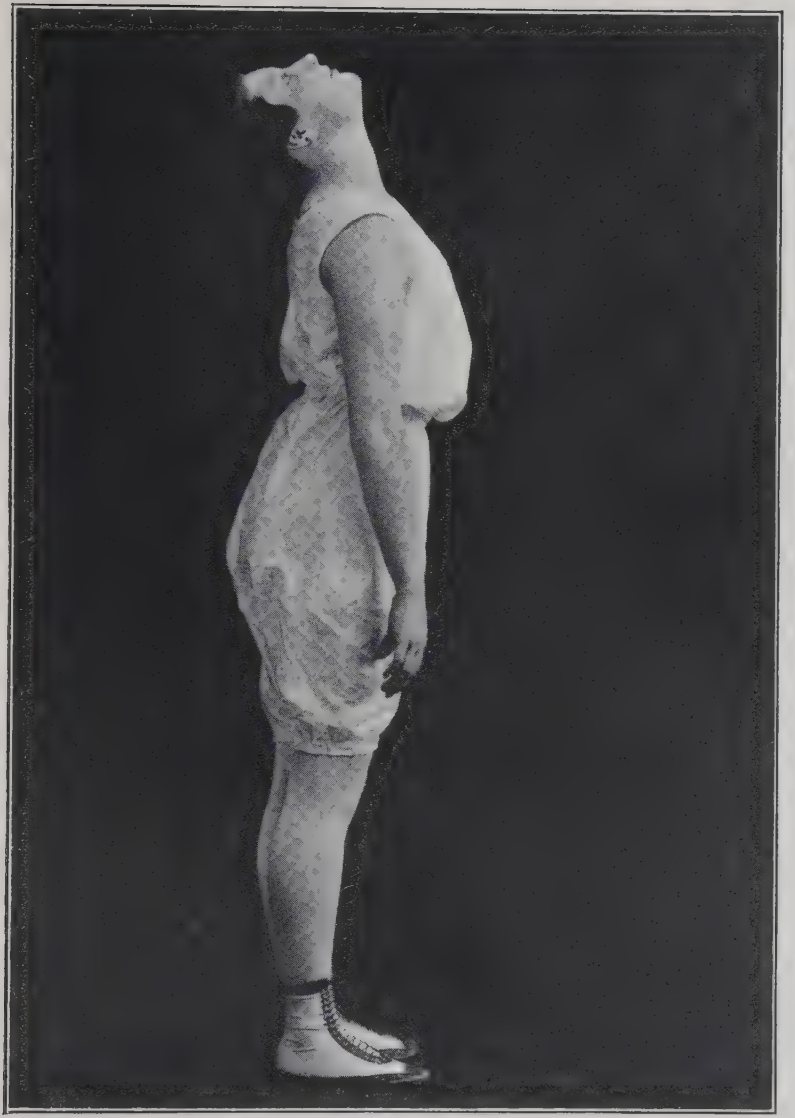
The chief advantage of dance movements lies in the necessity of performing them in a regular and rhythmic manner. When the rhythm of the dance demands that the leg or arm be extended, uplifted, or otherwise moved, it is necessary to repeat the movement in the same fashion in practically all dances, and this involves the same degree of physical effort in each instance.

To insure the performance of movements in rhythmic fashion, music, of course, is of great assistance. But it is by no means essential that even the most intricate dancing movements have the advantage of a musical accompaniment. All movements involved in dancing are performed on the basis of count. As a matter of fact, the most skilled exponents of dancing acquire the mastery of new movements by count and not by following actual music. Yet, if music is available, as for instance when one has a phonograph to supply it, it should be used for its value in making exercise pleasurable and attractive.

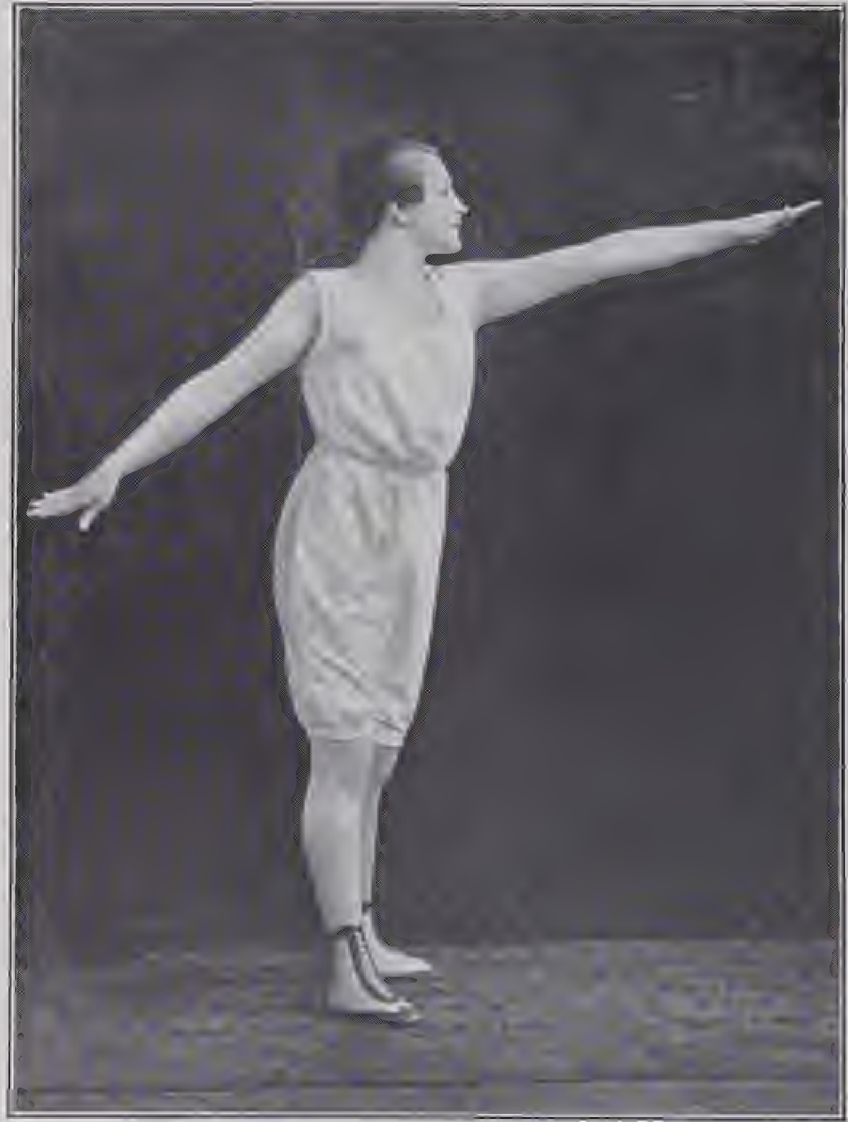
The most important point to keep in mind is that the entire body be kept free and lissome, and that any tendency to stiffness or rigidity of the muscles of the arms, legs or torso must be guarded against carefully.

Dance movements and other forms of exercise as well should serve to bring into play the muscles of the trunk and arms as well as those of the lower limbs. In fact, one of the greatest advantages of any form of exercise is its tendency to promote activity and agility of the body in general.

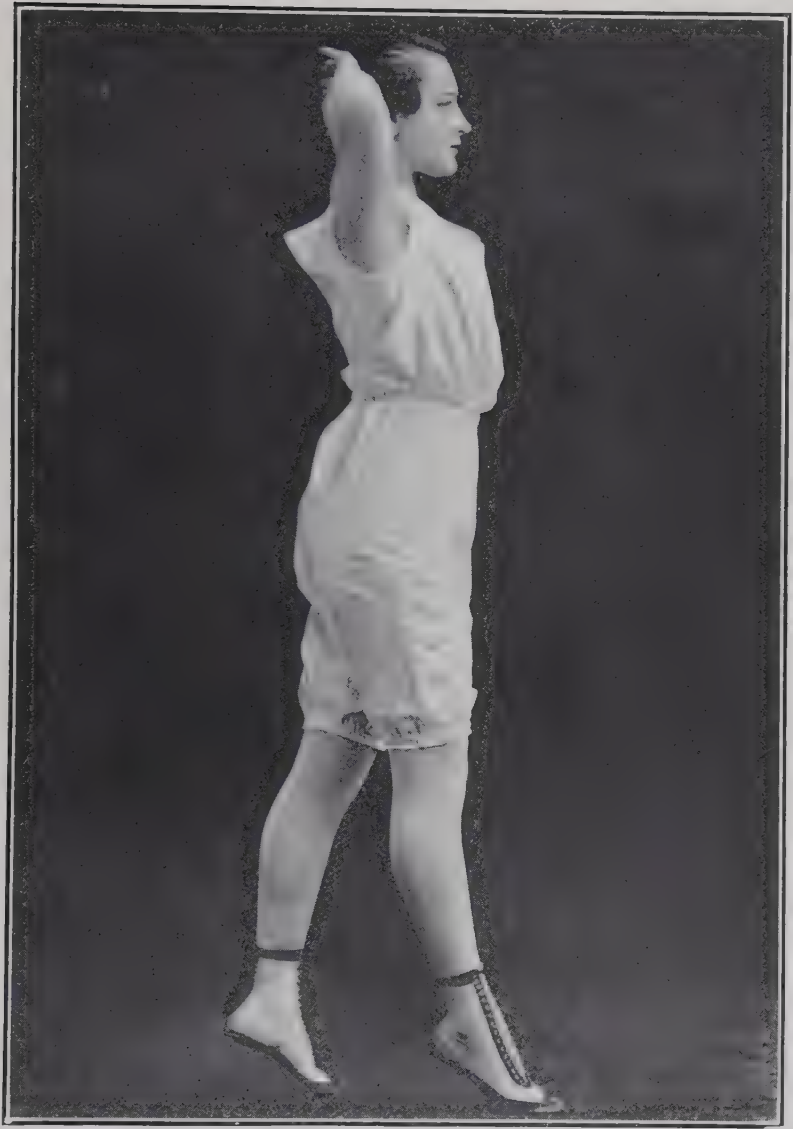
Summarizing, finally, it may be said that women may advantageously regard various types of fancy dancing as ideal forms of exercise. And so far as possible they should also perform systematic exercises in the form of dancing.



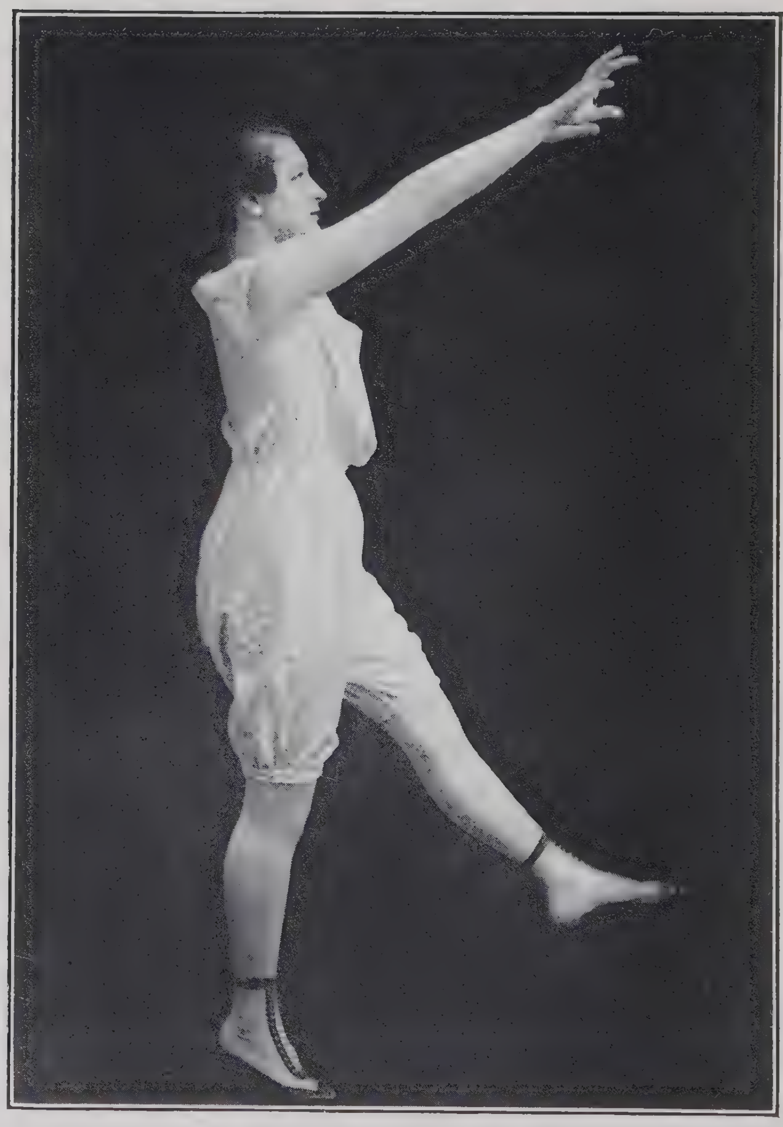
Inasmuch as bodily grace and poise depend primarily upon carriage, this simple exercise for improving the posture is invaluable. Simply by bringing the head far backward as illustrated, the spine is straightened, the chest raised and the body beautifully poised. Do this dozens of times each day.



This "wind-mill" exercise will give you poise and graceful carriage. The arms are swung round and round, first in one direction, then in the other, in a forward plane. Be sure that the shoulders follow the arms with a body-turning or twisting action at the waist. Thus, the left shoulder is extended forward with the left arm and then the right shoulder in turn is extended forward as the right arm is swung over. An ideal spine-loosening, chest-raising shoulder exercise.



To develop poise in walking, assume the position shown with the hands clasped behind the head and then walk back and forth and around your room on the tips of your toes. Try it to music. This can be done in no other way than gracefully.



With arms extended in front of the body, walk across the floor with knees straight, toes extended and a slight kicking action with each step, also swinging the arms up one or two feet with each step, as in the photograph.

ACQUIRING A QUEENLY CARRIAGE

By DOROTHY PEARL BUCHANAN

EVERY woman wants grace and poise. There is something in an erect and graceful bearing which suggests the majesty of a queen. Somehow this grace of bearing seems pre-eminently in harmony with the refinement and beauty which distinguish all women when at their best, and it is only natural that women should desire this quality even if only unconsciously or subconsciously.

In the matter of feminine attractiveness, graceful poise is, perhaps, next in importance to natural beauty of outline. That is because it is beauty. It is beauty in the sense that grace is beauty of movement. It is beauty of bearing, and no one can doubt that this quality is as vital a factor in womanly charm as symmetrical outlines and smoothly rounded contours.

Some women are naturally graceful and unconsciously well poised, just as certain types of people seem naturally more adept than others in the handling of their hands and bodily members. Some individuals seem to inherit a natural power of muscular co-ordination that makes them exceptionally agile and deft in their movements. It is the same with the quality known as grace. With certain types it seems to be more or less spontaneous.

And yet grace can be acquired. Physical poise can be cultivated. Even the most awkward woman can improve her muscular control and acquire a smoothness of movement and a quiet dignity of bearing that will give her the carriage which we are accustomed to think of as queenly. We need not concern ourselves with the correctness of the term. It does not matter if many queens are stiff and ungainly. It does not matter if many dancers, tennis players and swimmers have far more of this queenly quality than some real queens. It is sufficient for our purpose that the adjective carries the idea.

Beauty of bearing can be acquired just as may be beauty of outline. The latter may be secured through the simple development of the body. That is a matter of exercise.

All women instinctively recognize the beauty and suggestion of womanliness in a figure that is kept trim and erect. If deficient in this respect they try to acquire poise artificially. This is one of the chief reasons for the wearing of corsets, namely, the maintenance, through this artificial support, of an erect posture. Unfortunately they choose the wrong way to secure the desired result. The corset weakens the body, in the first place, often very seriously impairing the health through the pressure upon delicate internal organs. In the second place, it fails of its own object because of the stiffness which makes real grace of bearing impossible.

The very first requirement of a graceful carriage is a complete development of the entire body. No one can carry herself well without a high degree of that quality which may be called muscle tone. And muscle tone is impossible without a satisfactory development and the condition of vigor which goes with it. You should understand that there is what may be called a half-way state between complete relaxation of muscular tissue, such as prevails in sleep, and that powerful tension or contraction of the muscles involved in any exertion of strength. In other words, the muscles of the body when one is awake, even though not in action, are not entirely passive. They are in a somewhat active condition, a state of moderate firmness, and this is known as muscle tone.

This condition is emphasized when standing, walking or running, inasmuch as even those muscles which are not actively engaged in the effort have a certain degree of tension, giving one perfect control of every part of the body so as to keep it steady and well balanced and in harmony with the exertion of the moment. As soon as you recognize this quality in your own muscles you will begin to understand more clearly what we mean by muscle tone.

The woman who is well poised, who carries herself with a certain graceful smoothness of movement will be found to have this quality of muscle tone. It is your first essential. If you are soft, flabby, flaccid, toneless—not vocally, but muscularly—then the first thing for you to do is to follow persistently a system of all-around exercise that will strengthen and build up every part of the body. You will be ready to proceed more effectively with the cultivation of grace.

There are two important results that you should work for. The first is good posture, so far as the spine and upper body are concerned. The second is the faculty of moving with a certain freedom of action which belongs only to those who have learned to move with a "swing." Some persons move very stiffly; their actions are angular, awkward. This means imperfect muscular control.

To some extent the difficulty is mental. Too much hesitation and too much restraint in one's movements will give this stiff and awkward quality. It is frequently the result of self-consciousness, often the manifestation of an exaggerated self-repression. It is only when these mental restraints are eliminated and one learns to move as naturally and freely as a child that one will regain something of the grace that characterizes the healthy and active child previous to the time when the element of self-consciousness begins to develop.

You will only learn to move with a swing, so to speak, when you have acquired the knack of avoiding unnecessary tension and stiffness in the muscles. Learn the secret of relaxation of those parts which are not directly involved in the movement in hand. Remember that you will never have complete control of your muscles until you have mastered them to the extent that you are able to relax them voluntarily. Tension is easy. Relaxation at will means control.

Erect posture is the primary element in good bodily poise. It is a very simple matter. And yet it is very, very uncommon. Erect posture is not only a factor in beauty; it is a very important factor in health. This is true not only because it means a normal condition of the spine with a healthy state of the nerve centers, but because of its influence upon the functions of all the internal organs. Nature intended these organs to occupy a certain position in the body. They do their best work only when they occupy these allotted positions. When they are crowded out of position or permitted, through bad posture, to sag or fall several inches below, their efficiency is naturally interfered with. They are obliged to struggle against a severe handicap.

The erect posture, with the head held well up, the chest raised and the weight of the body distributed chiefly on the balls of the foot rather than on the heels, may be called the active position, as contrasted with the passive position in which the weight settles back upon the heels and the body, as a whole, expresses unreadiness for action or effort. The active, erect position, with the chest fairly full and high and the head erect, is the position of energy. It is the bearing of youth. It expresses energy, activity, life. Energy is always impressive. It means animation, ambition, enthusiasm. The erect position is the position of command. It is characteristic of the army officer. It suggests the spirit and dominance of his personality. But also it is demanded of the men in the rank and file of the army because it goes with the sense of courage.

The erect position is the position of pride. You remember the impressions made upon you when your favorite novelist tells you how the heroine "draws herself up to her full height." Pride, self-respect, a haughty demeanor, all implying a certain exaltation of spirit, are expressed in an erect bearing. It is for this reason that it is actually the bearing of a queen. Self-confidence, courage, joy, hope and other of the more positive, helpful and exalting qualities and emotions go with an erect bearing, whereas timidity, fear, dejection and grief are suggested by the heavily hanging head and generally drooping frame.

The mental factor, therefore, is extremely important in the cultivation of grace and poise. Buoyancy of spirit will help to give you buoyancy of bodily movement. Therefore, try to have and feel these helpful thoughts and emotions. You will find that as you think them you will spontaneously assume the corresponding attitude. Even the physical act of assuming mechanically this strong, positive, hopeful attitude will help you to be all that this improved posture expresses. You will find yourself becoming cheerful, joyful, self-confident, courageous, self-respecting and even stronger willed. Don't forget that these qualities and the bodily posture correspond.

Coming back to the question of exercise for our present purpose. The universal tendency of the weak, the careless, and the lazy is to allow the head and shoulders to droop, the chest to flatten and the body generally to sag until the region of the waist and below becomes more prominent than the chest above it. There is nothing attractive in this attitude. It is the full and prominent chest that gives beauty to the human torso.

Parents and teachers have commonly over-emphasized the position of the shoulders and their relation to the carriage of the body. Children are instructed to "hold their shoulders back." But the real fault lies in the position of the spine. If the upper spine is held erect, which means an erect position of the head, the entire body will naturally and inevitably assume correct lines. The mere backward bending of the head, as in one of the exercises illustrated, will have the effect of drawing up the chest and, at the same time, causing the pulling inward and upward of the region of the stomach and abdomen. This may mean a slight exaggeration in the curve in the small of the back. If so, don't let that worry you; it is because this curve is a part of a well balanced and erect bearing. If at any time you find your posture faulty, the mere backward stretching of the head will incidentally improve your entire carriage. There are other arm exercises, such as stretching the arms above head, that raise the chest and improve the alignment of the spine, which accomplish the same result.

Much attention is naturally given to the military drill position. This is thoroughly well founded physiologically as well as psychologically. It sets a man up. It will do the same with a woman. It should not necessarily mean a strained position of the body. The chest should not be lifted to an exaggerated degree. What it really means is simply the proper balance of the body from the waist up in such a way that there is the least strain, with every part in a position to function most perfectly.

In the practice of exercises for the cultivation of grace, any form of dancing will usually be advantageous, but it will be best if this can be done always in flat-heeled or low-heeled shoes. This will help you to gain the buoyancy and grace of movement which can only be secured when the weight of the body is carried lightly on the toes or balls of the foot. When high-heeled shoes are worn, the appearance is that of stepping upon the toes, whereas the protruding heel really makes it inevitable that too much weight is borne by the heel. In walking in French shoes one proceeds by stamping her heels, as it were, upon the floor or sidewalk. Graceful walking is impossible under such conditions. But if you go barefooted or wear low-heeled shoes, so that you can raise the weight upon the toes, you will at once find that freedom, ease and grace of movement are natural and even spontaneous.

Normal bust development as expressed in the masterpiece of great artists is shown in this characteristic sculpture. The excessively large bust is neither indicative of vitality nor promising in respect to functional capacity.

THE BUST—HOW IT MAY BE DEVELOPED

By DR. C. S. CARR

FIRST and foremost, I believe that nature works for practical ends. Busts are not merely ornaments, as the average woman seems to think, but are provided by nature for a practical purpose. Their development naturally begins with the beginning of sexual life. As long as the sexual instinct exists in a natural way, the busts will develop correspondingly. However, if the sexual instincts are disturbed, either by disappointment, disease or unnatural mode of life of any sort, the development of the bust will be arrested.

There is a vital connection between the busts and the sexual life. Blood vessels and nerves connect the two functions very intimately. Anything happening to the sexual organs is very apt to produce, by sympathy, changes to the bust. This fact is brought to the attention of the physician almost every day.

The maternal instincts of a girl begin to manifest themselves in one way or another about the age of sixteen. If she is living a natural and free life, these instincts will become more and more imperious, and if she is surrounded by conditions that permit her to follow these instincts—if she becomes a happy mother at an early age—the busts take care of themselves and need no attention so far as their development is concerned. That is what nature provided them for. But, if on the other hand she is surrounded by circumstances of life that compel her to squelch her maternal instincts, instead of finding a congenial mate and fulfilling the functions for which she was intended, nature will begin to withdraw from the sexual function the energy that belongs to it and utilize it in whatever function the girl is performing. If she is teaching school, clerking in a store or doing housework, or anything else that takes her energy, and she lays aside all thoughts of maternity and sexual impulses and conjugal love—all these things put in the background and in the place of them the pressing duties of commercial life are substituted—the busts will either not develop at all, or what development has occurred will come to a standstill, or probably be gradually lost.

Now these remarks state that case as it really is. The breasts have a normal function, and if that function is not performed the chances are that their development will either cease or go backwards. Well, what can we do about it?

There are a few things that can be done. The girl should carefully avoid trifling with subjects that relate to sexual matters. To arouse sexual feelings and passions by reckless contact with the opposite sex, by reading vicious books, or by looking at suggestive pictures, all these things tend to prematurely arouse sexual functions which if they do not have their natural expression will react to the damage of the whole sexual apparatus, which includes the development of the busts.

Second, by avoiding pressure of the nerves and blood vessels that are necessary for the normal development of the bust. The mammary arteries and some important nerve trunks that supply the breasts come from below. They must pass up from the pelvis to the thorax through the slim portion of the body. Any tightening of the clothing, or corsets about the slim portion of the body, tends to cut off the circulation of blood that naturally supplies the breasts. It also benumbs the nerves that carry sensation and vital force.

Much has been said about tight lacing, but I seldom see any reference to one damage which tight lacing produces, and that is the shrinking of the busts. This is almost inevitable. There are women who lace tightly and yet have a well-developed bust. They accomplish this by relieving themselves of the tight lacing as soon as possible, so that they spend at least twelve or fourteen hours a day with perfect freedom and ease about the stomach.

I am often asked, "Does mechanical manipulation assist in the development of the busts?" My answer is that it depends altogether upon the manipulations. The ordinary mechanical means have little or nothing to do with the development of the glands which constitute the breasts. The pectoral muscles underneath the breasts undoubtedly can be thickened and developed by manipulation, by massage and the like, but the mammary glands that give shape and bulk to the breasts cannot be developed in that way. If they are developed at all it will be by mechanical means that excite vital processes through the action of the vascular and nervous systems. This is brought about naturally by congenial marriage. It can often be entirely accomplished by the use of a very simple device which will be described later. As in the development of any other part of the body, mental influences play a large part. This is especially true in the development of the busts.

Any woman who has the care of a growing baby that she really loves, fondles the baby and in a large measure becomes the baby's mother, which arouses within her wholesome maternal feelings, and her life with the child closely resembles the life of the mother, such an exercise is vastly more likely to develop the breasts than any manipulation that could be devised.

The bust developers such as are applied to the breasts hoping to enlarge them, may possibly improve the skin, and as before stated, develop the muscles of the chest, but every girl who reads these lines and has ever tried any of these breast developers will recognize I am telling the truth when I say they nearly always disappoint. Perhaps they always do.

I wish to impress it upon the minds of the girls that the development of the breasts is a vital process which depends upon the emotions and feelings vastly more than it does upon any exercise or manipulation.

The muscles of any part of the body can be made to enlarge by simply exercising, but the enlargement will be much more lasting and rapid if the exercise is done in the natural way, that is, some wholesome function or work is performed instead of mere artificial exercise. Then the development of the muscles comes about much more satisfactorily if it is associated with exhilaration of mind and that satisfaction of the senses which one receives when doing some wholesome work.

The busts, unlike the muscles, are more largely supplied by the organic nervous system, and are much further removed from any artificial effort toward their development. One single emotion of the right kind will send the blood surging to the busts, as no remedies could possibly do. These emotions, if they are wholesome and proper, operate as a natural tonic that cannot be imitated by any drug or treatment. Such a tonic causes the breasts to enlarge and beautify themselves without any self-conscious effort.

It is a notable fact that in the lower walks of life, where the girl is not kept in school beyond her sexual development, is married early and the sexual functions are allowed to govern her conduct, that the breasts are greatly developed, often in excess of natural beauty. The reason is a vital one, rather than a self-conscious one. It is Nature's attempt to supply what is needed.

That woman who has no use for her breasts and who is living a life that is wholly incompatible with natural instincts and sexual impulses, the chances are the normal development of the busts will not take place, although she may spend hundred of dollars for remedies.

In most cases the busts are sufficiently developed when a girl is sixteen, seventeen and eighteen years old, after which age, if she remain unmarried, the busts will begin to shrink and lose their development. The same thing has happened to the bust that happens to any other organ. Disuse favors atrophy.

In the natural order of things, maternity would have occurred early enough to prevent the loss of the busts. The development of the busts is greatly dependent upon the maternal instincts. The tendency of the day is to postpone marriage much beyond the age demanded by Nature. Hence it is that there are a multitude of women who are well developed in all other respects, but find to their chagrin that the busts are gradually disappearing.

In the days when I practiced medicine they did not have the conveniences for artificial feeding of babies that they have today. It matters little at this time whether a mother is able to nurse her child or not. The average trained nurse, by the assistance of artificially prepared foods, can attend to the wants of the infant so well that it is regarded as no great loss if the mother is unable to nurse the baby.

But in the days when I began the practice of medicine, it was highly important that the mother should nurse the baby. The life of the baby generally depended upon it. Therefore, if a new mother was found with an under development of the breasts, a breast pump was at once supplied.

Many a time I have seen a wonderful transformation occur by the application of the breast pump. The breast was small and shriveled and the nipple undeveloped and drawn in. The application of the breast pump would soon work a wonderful change. A woman with scarcely any breasts at all would soon find herself in possession of a well-developed bust, and able to nurse her child satisfactorily.

This will apply to the unmarried woman exactly as to the married woman. An ordinary breast pump applied once a day will do very well to begin with. It should be applied cautiously at first so as not to create any soreness of the nipples. But in order to accomplish the development of the busts, a larger instrument may be necessary. The very largest dry-cup, with a specially strong rubber bulb, will do the work much more thoroughly. A glass vacuum apparatus, made on purpose for bust development, would in some particulars be more sure to produce results, although as said before, the ordinary breast pump will do very well. Indeed, it will bring about a development of the busts quite astonishing. The special instrument just alluded to may be used only in cases where the smaller breast pump does not prove effective.

Personally I am a believer in early marriages. The function of these maternal organs is prevented by delayed marriages, and the result is not only the loss of the figure, but many times an absolute inability to perform the functions of a mother after the child is born.

There are many reasons, economic and social, why marriage is postponed, and an increasing number of cases where marriage is permanently ruled out. In such cases, except in very fleshy people, the breasts are usually sacrificed. This can only be corrected by partial restoration of the function of the breasts, as described.

At first it may seem too easy to be real. Curiously enough, those who make use of this very simple means of developing the bust, seem unwilling to admit it even to their nearest friend. Thus it is that the only real bust developer in existence is kept practically a secret, while the hundreds of alleged bust developers, which cost a great deal of money, are kept before the public mind by all the tricks of modern advertising.

In attempting to use the breast pump, however, we should consider some details. First, the nipple should be moistened with oil. Perhaps cream would be the best form of oil. It should be warm and well rubbed in. The vacuum cup or the breast pump should also be warm. This furnishes the warmth and the moisture necessary.

In introducing a suction by operating the rubber bulb, the nipple can be observed through the glass cup, and too much force should not be exercised at first. If it is operated gradually it will be noticed that the nipple begins to enlarge and look red, and the surrounding area will soon be the same. The treatment may be continued gently for ten or fifteen minutes each time. If it is done twice a day so much the better. After the treatment, it is well to gently knead and rub the whole breast, in order to distribute the congestion which has occurred in the region of the nipple.

It is not generally known that the nipple of a female breast contains erectile tissue. It is only when the erectile tissue of the nipple is excited to action that we can be sure that it has received exactly the right sort of stimulation. Therefore this should be looked for while the breast is being treated. The vacuum treatment will tend to provoke this, as well as the application of the warm lubrication.

But what I want to impress upon the mind of the reader is that it is only through the nervous mechanism of the breasts that the proper physiological forces can be brought to bear in the matter. The result will not be in accordance with the amount of force used, but it will be in exact proportion to the amount of gentle stimulation and excitation which produces a pleasurable glow in the breasts.

I am aware that this is a very delicate subject, and it is with some diffidence that I am attempting to describe it with sufficient detail to lead to success on the part of the reader. Properly understood and applied, this procedure ought not to completely fail in any instance.

There are, however, some further precautions that I ought not to omit. In the natural development of the breasts in a normal girl we have a mental condition that is peculiar to the girl. It is the age of love and good feeling. Unless something interferes, the nervous system of the girl is thrilled with affection and maternal feelings. She knows nothing of hatred and jealousy. Her feelings are mobile and friendly. She loves her dolly. She fondles the kitten. She converts everything she possibly can into a pet. This keeps her brain and nervous system in a continual glow of physical life.

Her love is innocent. It has no sinister purpose behind it at all. It ebbs and flows under the influence of the most chaste impulses, just as nature intended. But it has the effect that nothing else can imitate, in charging and surcharging the generative organs with magnetism and nutrition needed for their marvelous development. All this is especially true of the breasts. Therefore the mental conditions cannot be overlooked.

Let no woman expect results without complying with conditions. A mind filled with jealousy and hate disturbs the nervous system in exactly the way as to defeat development of this sort. The breasts shrivel. The nipples draw in and become atrophied under the influence of spite and rancor and hatred. In the case of the woman who scolds from morning to night, who finds fault, resorts to punishment and brute force, or indulges in secret envy and malice, even though she gives no expression to it, nature will withdraw from her one of her charms, a well rounded bust.

That woman who has preserved within herself the modesty and sexual timidity that was her charm in early maidenhood, that woman who has so preserved her maidenhood, both physical and mental, that a blush comes as easily to her as it did when she was sixteen, such a woman is in possession of a natural tonic for the busts that no chemist can ever hope to imitate. That capillary congestion which we call a blush does not stop when it touches the cheek or reddens the pink and white throat. It spreads downwards and pervades the deeper tissues, bringing with it a dose of red, warm blood, to which the mammary glands and nipples respond with alacrity, and from which their integrity is constantly maintained.

Oh, lovable and loving woman, if you only knew the secret of your beauty you would no longer go hunting about among the attractive labels at the drug store for some elixir to restore you the curves and rounded beauties you have lost. You would turn from all these and go within yourself, search among your own sensibilities and womanly impulses for disused and misused powers of love, to coax back once more into activity their life-giving virilities.

Love something, as you used to when you were a bouncing, beautiful girl. Mother something, as you would have done had circumstances permitted. Be somebody's sweetheart. Keep near to you the budding maturity and innocence of young girls like you were once. Listen to their story. Sympathize with their tragedies and triumphs. It is in this direction that you will find Nature's pharmacy stored with specific remedies.

The rantankerous, hard-fisted, scowling woman who hates a thousand times as much as she loves, can hope to be nothing else but what she really is, a slab-sided, flat-chested creature, fit only for war and turmoil. To just that degree that a woman gives way to unwomanly feelings, to just that degree that she loses her grip upon the tingling feelings that made her so interesting when she was a girl, to just a corresponding degree that she loses these things will she lose her physical development.

Love and more love is what the woman needs who desires to be beautiful. Not the love of unrequited sexual passion that withers and brings no healing, but the love of beauty and service that brings complete satisfaction by its own indulgence. Not a sexless love either, but a bountiful love that takes in all creation, calls nothing unclean, makes nothing unholy by its touch, shrinks from nothing that nature endowed her with.

This can be done even though the pathway that she has chosen for herself has not led to wifehood or motherhood. If she had ears to hear or eyes to see she would hear the voices of lonely ones crying for her, or see the hands of deserted ones reaching out for her, furnishing ample opportunity for the bestowal of the richest, the warmest love of which she is capable.

HOW TO DISCARD CORSETS

BY DOROTHY PEARL BUCHANAN

DO you wear a corset? If so, why? Do you need one? Again, why?

If you don't need one, there is no good reason why you should wear one.

If you do need one, it is high time that you make a study of the physical condition that seems to make it necessary. And improve it.

In the first place, no woman needs a corset, either for comfort or appearance, unless she is in a muscular condition that she ought to be ashamed of.

When a woman says that she depends upon her corset or that she cannot get along without it, she means that she is too weak to hold herself erect, or as some say, "to hold herself together." Just fancy for a moment the desperate necessity of holding oneself together by a semi-rigid encasement of this kind, otherwise she might become separated or fall to pieces! ! !

In a natural and normal condition, a woman does not need a corset any more than a man or a child needs one. She can stand erect not only on her own legs but on her own backbone. A woman has just as many muscles as a man, muscles which are designed to move the body and its parts in the same way, muscles which enable her to preserve the bodily posture in the same way.

Every woman is given by Nature a group of muscles about the back, waist and abdominal region, which form a powerful corset when they are normally developed. They give this part of the body tone and firmness. They enable her to maintain an erect position and preserve the trim, clean outlines which are characteristic of every normally vigorous person of either sex. It is only when these muscles about the lower trunk are weakened and atrophied that there seems to be any excuse for the artificial substitute that puts a woman into a class with the insects and the shell-fishes.

When you facetiously call a man a lobster, you forget that the term would more fittingly apply to the corseted woman, because her body is enclosed in a protecting shell. Vertebrate creatures, including ourselves (when uncorseted), have their supporting bony structure inside, with the organs and muscles internal. The body of an insect is a shell; its legs are pipes with the muscles inside. The same with a crab. Consequently, when the scornful and corseted suffragette witheringly denounces "mere man" as a "poor insect," she overlooks the one thing that would tend to put either one or the other into the entomological or the shell-fish classification. We must admit, however, that many suffragettes are included in the progressive group of women who practice physical culture and do not wear corsets.

The corset is an artificial, unnatural device, and therefore bound to react injuriously upon the wearer. The weak woman depends upon it to hold herself up, but largely because this very corset has made her weak. Few healthy girls in the fresh young years when they commence to wear a corset need any prop or support of this kind. It is a mistake ever to commence its use. But if one is already addicted to it one should reform.

It is true that the corset styles of recent years have been a very great improvement upon the pinched waist, hourglass types which prevailed for so many decades. At least there has been a certain amount of freedom for the bust and even some for the waistline. Nevertheless, there is still some constriction of this part of the body in many instances, and in practically all cases there is an abnormal and injurious pressure upon the abdomen. With this direct backward pressure, it is questionable if nearly as much harm is not accomplished at times as with the former squeezing of the body at the waistline, particularly since the extreme flattening of the abdomen directly compresses the delicate pelvic organs.

It is curious how corset fashions change. The old ideal of the pinched-waist meant a bulging and over-emphasis of the hips and even of the abdomen. Later there came the ideal of the hipless figure, in which the supreme effort was made to cause the hips to disappear. But now that woman may have hips and waists, the abdomen must vanish completely. It must be subjected to a flattening that is out of all semblance to any normal human contour.

Why cannot a woman be permitted to have a normal and natural figure, such as one sees in the firm and well built athletic girl, or such as one may find portrayed in the masterpieces of sculpture? The abdomen should neither protrude on the one hand nor should it be flattened inward. In the symmetrical, perfectly developed body, properly carried, the abdomen is naturally retracted to the proper degree, becoming inconspicuous because it occupies its natural position. It should not appear to have been cut off. It should present the normal moderate convexity which Nature gave it, and without protruding.

We may as well admit frankly that in this very question of the protruding abdomen lies the great fundamental trouble of large numbers of women, and by reason of which they feel that a corset or girdle of some kind is necessary. It will be said that the naturally retracted abdomen is ideal, but that in actual individual cases the abdomen becomes too prominent, at least after the age of twenty-five or thirty, and needs some artificial restraint. The complaint is thoroughly justified, but the usual treatment in the form of a corset is not. In the first place, the difficulty lies partly in the accumulation of fatty tissue, and in the second place in faulty posture.

With many women there seems to be a natural tendency for fat to deposit itself about the hips and abdomen, but so far as the latter is concerned, the process is greatly hastened by the degeneration of the muscular structures of this part. Exercise for the abdomen will maintain these muscles in a vigorous condition, and prevent the excessive formation of fatty tissue hereabout. Furthermore, these muscles, if properly developed, give tone to this part of the body and naturally prevent any sagging or bulging.

What is even more important, however, is the question of correct posture. This assumes the very greatest importance as soon as the corset is removed and one relaxes into the slouching position which causes the abdomen to become prominent. For this reason, the woman accustomed to corset wearing should of all others give special attention to exercises for strengthening all these parts and for acquiring good posture.

Remember that the straightening up of the body, involving the raising and expanding of the chest, naturally brings with it the drawing inward and upward of the abdomen, also the arching of the curve of the back. On this account, for the purposes of exercise, it is well to exaggerate these positions so as to get the full action of the muscles concerned, and thus help to establish the correct standing or sitting position.

Careless and faulty posture inevitably leads in the course of time to a condition known as enteroptosis. This means simply a prolapse of the bowels, with the sagging down also of the liver, stomach and other organs, several inches below the normal position. This naturally means a very great crowding of the lower abdominal cavity and the protruding of this region.

It will be seen that in a condition of this kind exercises for building up the abdominal walls and also for improving the posture are vitally necessary. The purpose should be to restore all of these organs to their proper position. Reclining exercises will help in this respect, especially if performed upon an inclined board. Place an ironing board with one end on the floor and the other on a chair, or the side of a bed, fixed securely, so that it will not slip. Then perform the standard reclining exercises with the feet at the upper end of the board.

Strengthen your body and learn to carry yourself well, which is largely a matter of keeping the head up and back, and you will find no further need for the corset so far as bodily support is concerned. Many women will declare that a corset is necessary in order to support the clothing properly. But this is not the case if the presentable little frocks and other one-piece dresses now so popular, are used. The fact is that if you build up a perfect figure of your own, you will make a much more attractive appearance than you possibly could by putting on your clothes over an artificial shape, such as even the best corset could give you.

The question arises as to whether or not the women of the future will wear corsets. There are reasons for thinking that the future will bring great changes along these lines. Referring to the history of corset wearing, Milo Hastings writes:

"The first historic allusion to the corset and its use was by the poet Homer, who tells that Juno borrowed a girdle from Venus with a view of wearing it to keep Jupiter's love from growing cold."

Later Greek writers explain matters without making personal allusions. The ladies, it seems, wore cloth bands or girdles, one to support the breasts and one to support or draw in the "stomach" and sometimes a third one between these two.

The Roman ladies also used the waist and breast bands. The following lines are from Tarentus, a Roman dramatist, born 560 B. C.:

"The pretty creature isn't at all like our town girls whose mothers saddle their backs and straight lace their waists to make them well shaped."

Four centuries later Galen, a Roman M. D., started the anti-corset crusade, which has faithfully trailed the garment through two thousand years of history.

In medieval times the first plan of waist restriction was with stout cloth jackets, which laced up the front. One picture of such dates from the year 1043. Joan of Arc was wearing a very slouchy looking one when she posed for the picture that now hangs in the Metropolitan Museum of Art.

The word "corset" is first recorded in a manuscript of 1265. A writer of the following century says:

"The women have contracted a vitiated taste and not being content with their form as God hath made it, provide a corset or bodice—a stiff, unnatural disguisement—for making themselves look small."

Things went on from more to most, and culminated during the reign of Catherine de Medici in France and Elizabeth in England.

On what instinct of human nature rests this desire to make the human trunk as stiff and unbending as a lobster's thorax I know not. But it is indisputable that for two and one-half centuries the object of the corset was not only to make the waist look small, but to make it straight and stiff, and the shape of an inverted cone.

The English adopted the steel corset-covers of the De Medici pattern but made further improvements. Instead of deriving the principle of smallness from a lace fabric, and of stiffness from a separate steel cage, they had vertical stiff bars of steel, whalebone, sole leather, etc., sewed into a fabric bodice.

And then came the French Revolution, and in the effort to destroy every vestige of the memory of the tyranny of Royal Courts that had decreed fashions as well as laws, corsets and the huge skirts that usually accompanied them, were discarded overnight. The return was to the classic garb of Greece, the waistline was moved up just beneath the breasts in the directoire gown, and the passions for long bodices and small waists were forgotten.

Truth crushed to earth shall rise again—so did corsets.

No sooner had they sent Napoleon to St. Helena and restored the monarchy until waists grew small again—and busts and hips grew large.

So the corset came back and "the span" again became the standard of elegance for a lady's waist.

As in other phases of social life, the present generation has seen an acceleration of evolution in dress. In the eighties and nineties the ideal effect of the corset was to give big round busts and hips. "Shape" in a woman came to mean an excess of fat squeezed upward and downward until it gave the hourglass effect when observed from either front or side view.

Then came the "straight front." It was not the old ideal of straightness which descended in every direction to a waist line, below which sudden flaring of starch and wicker work left all to the imagination. But the recent "straight front" is an effort to eliminate the waist line in front and put it all in the rear. This required a mannerism of carriage, as well as lacing, and many a small boy amused his comrades by learning the straight front walk.

The straight front introduced something new into the corset world—the idea of "shaping" the hips. The first plan was merely to lengthen the corset downward; then followed the hip corset which leaves the breast scot free and makes only nominal the restriction of the waist. And so came the effort to reduce the apparent size of the hips which a hundred generations of women have spent untold millions of wealth and incommensurate suffering in trying to enlarge.

And last of all, a fashion in carriage has been added which is a reversal of the tactics of the last decade and consists of a wild ambition to wear the hips in front.

The opposition to corsets has been bitter for a thousand years. In the earlier times it took the form of bans and edicts of a political and religious nature. In the eighteenth century the chief form of attack was satire. Medical and health writers of all times have heaped criticism on the corsets. Bleeding of the lungs, abortion, curvature of the spine and consumption were commonly laid at their door.

I am optimistic that the days of the corset are about numbered, and here are my reasons for believing that it may be so. I shall state them in the reverse order to my idea of their effectiveness.

1—The continued hygienic preachment against the corset is accumulative in its effects as it increases in argumentative value when publicly considered, whereas the arguments for the corset, that are overwhelmingly powerful in the brainless sex rivalry of an old-fashioned boarding school, become absurd when discussed by men and women meeting on common intellectual ground.

2—The increasing popularity of athletics, and the study of eugenics will combine with the anatomically based arts, to increase the non-sex (or more properly the addition-to-sex) interest in women's bodily development.

3—The intellectual and economic emancipation of woman will work for the elimination of the corset, as a restriction of physical work and play—for the same reason that a similar emancipation of Turkish or Chinese women would eradicate face veiling and feet binding.

THE OLYMPIAN SYSTEM

"Mens sana in corpore sano"

PART ONE

EXERCISE

SECTION FOUR

RECREATION AND ATHLETICS

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PLAY A VITAL NECESSITY

By CARL EASTON WILLIAMS

BETWEEN play and amusement there is a marked difference. Play may be said to be an active form of recreation, while amusement is generally passive. Amusement is rather a matter of mental entertainment, while play more commonly combines both mental and physical activity, often with special emphasis upon the latter. True, certain forms of play, as in some familiar household or social games, may be almost entirely mental in character, but even such play involves active participation of some kind rather than the passive or receptive mental interest to be found in something that only amuses. To play is to occupy oneself in some way, for amusement or pleasure; to engage in any exercise or sport or diversion, as the dictionary says, to take part in a game, or to sport or frisk. It means more than mere amusement, even though it may amuse. Both play and amusement are of value for purposes of recreation, but play has a positive constructive value because of its being a form of activity, whereas amusement only affords relaxation and involves recreation chiefly in the sense of recuperation.

So that while amusement, through its relaxing and recuperative influence, may have a certain health-preserving value, play may have an educational, body-building, strengthening and otherwise constructive character that is lacking in the former. In adult life we are perhaps too often satisfied with mere amusement when it would be much more to our advantage if we could retain throughout life the youthful habit of play. But we will come back to that later.

Play on first thought appears to be a form of spontaneous activity entered into for the sake of pleasure. But we find that it means much more than that. To many of those who have never thought about it, play seems to have little meaning except as it is something to be distinguished from work. It is casually looked upon as merely "having fun" in contrast with work. But to the young it is really the serious business of life, even though they do not take it seriously. It is their work, in a sense, for it is as necessary a part of their life as the real work that they will have to do when they grow up.

Play for the children is really a serious business, but they enjoy it because it answers to the demands of the instincts implanted in them for this purpose. They enjoy it, too, because it is self-activity, just as we grown-up folks can also enjoy work that we choose to do instead of being compelled to do, and which is self-expression for us just as spontaneous play is self-expression for the child.

I do not mean that children are always happy in their play, or that they play only because it makes them happy. Sometimes it does not, if they have not happy dispositions, but they play just the same. As a general thing children are happy when at play, if they are normal. But the point is that they do not play simply for fun, but because the impulse is in them to play, to be active, to use their muscles and their minds, and in that way to learn how to use them.

ing the very hardest training up to the very day before a contest. When you see an ordinarily brilliant and clever boxer fail to do himself justice, when he seems slow and lacking in his customary energy, it is far more often the result of over-training than of under-training. A rest of two days would probably have made all the difference in the world. A rest of a week is sometimes advantageous. Championships have been lost through this simple mistake in training.

It is true that boxers continue the severe training grind up to the last day partly because of the necessity of "making weight," that is to say, scaling down to a stipulated weight on the day of the contest. But there is no advantage in overworking up to the last day, thus choking the body with fatigue-poisons and making the muscles slow and stiff, when a reduction of the food supply or even a complete fast of one or two days would more easily take care of the weight question. A fast of a day or two will not weaken a well-nourished athlete. It would be far better to enter a contest with an exceedingly empty stomach but with muscles clean and fresh than to be well fed but with muscles slow and stiff from fatigue. In any case, warm baths and massage will go far to relieve such stiffness.

Running one hundred yards properly requires a tremendous amount of strength and energy. One should not attempt it during the first three or four weeks of training. A few starts each day, and running perhaps one hundred and fifty yards at a good swinging stride, or "three-quarters speed," would be sufficient for a day's work in the beginning, with some easy jogging.

Thorough bodily warmth before attempting any athletic exertion is important, especially in the early spring, when the weather is raw and chilly. It is well to do considerable jogging or dancing in a good sweater, and clad in warm trousers, to get the muscles thoroughly warmed up before attempting any sprints. This warming-up also applies to competition.

There is danger of serious injury from violent use of the muscles when cold and stiff. It is also important when sprinting hard to slow down easily, to avoid strains. Don't pull up short and try to stop quickly.

The daily practice of hurdling or broad-jumping is not always the best preparation for these events. Success really depends on speed, and this is best gained by the daily practice of sprinting, trying the hurdles or the jumps only two or three times a week. In the same way it is not desirable to undergo the strain of pole vaulting every day. Exercise on gymnastic apparatus can often be advantageously substituted for the pole vaulting. Any strain calls for complete rest.

In training for distance work, there are two elements to be considered, strength and endurance. Speed depends upon strength, and also develops strength. For this reason the distance runner should do a certain amount of fast work. One should not expect to run the distance for which he is training each day in practice. His purpose should be merely to do such work from day to day as will enable him to run that distance at his best on the day of the prospective competition. If one is training for a mile run, for instance, he should start out to build endurance by running at a fairly comfortable pace a distance considerably greater than a mile. But also, perhaps on alternate days, he should do some fast running. To run a quarter of a mile much faster than the speed at which one expects to run a mile race, will tend to develop the strength to maintain the mile pace easily. After three or four weeks of training, one may be able to run a half or three-quarters of a mile at a pace approximating that which he must expect to follow in running the mile race. It is in this way that one gradually works up to the ultimate condition of fitness for competition. Similar principles of training apply to other distances.

So far as Marathon running is concerned, it would be much better for the average athlete to cover this distance by installments. Spread your Marathon over a week, taking three or four miles each day. Marathon running is a wonderful *test* of endurance, but a very poor way to attempt to *build* vitality. It is too great a drain upon the system. A few miles of cross-country running will be found an ideal means of building stamina and manhood. Cross-country work is commonly found to be a means of gaining weight. But Marathon running is too much of a good thing. Only those of mature years and long experience in distance running should attempt such a distance, for it will not hurt them.

It is a good plan for the young athlete to "make haste slowly." Don't imagine that you are going to accomplish wonders during your first season. As a rule, it takes three or four years of training and sometimes even longer participation before one begins to approach the best possible form of which he is capable. Do not force yourself too much. By so doing, you will only defeat your own purpose.

Particularly is this true in connection with boyhood athletics. Too much competition and training in high school may even prevent the realization of one's best possibilities in later years. Boys of sixteen or seventeen should not take athletics too seriously. They should only "play" at the game. Never mind the records. For boys under fifteen, it would be better to run sprints of only fifty yards, rather than one hundred. In relay races, teams of four boys should run only a half mile. Boys in their growing years should be content to grow. They should play all kinds of active games, and they should also participate in athletics to the extent of having as much fun as possible. But they should not try to compete against seasoned athletes.

Athletic sports are so valuable a means of maintaining bodily vigor and energy that they should be continued into middle age. The greatest mistake of the athlete is suddenly to break off his activities and settle down to an inactive, sedentary life. The man or woman once muscularly well developed finds it a simple matter to retain this development. We should not only approve of athletics for the youth of the country, but we should strive for an ideal physical condition of mature men.

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We will pass by the subject of diet. That which is best to maintain strength and health in ordinary life is also best for athletic purposes. Certainly it is not wise to make any sudden changes in one's food on the theory that training calls for a special diet. At the same time, all dietetic abuses should positively be discontinued. And it is well to remember that one should not attempt to do any hard athletic work except on an empty stomach, that is to say, not within three or four hours after eating. The general health requirements, such as bathing, sleep and fresh air, are taken for granted.

The most important point for the novice to consider is his general physical development. There is no greater mistake than for a raw-boned, undeveloped boy to attempt the violent strain of competition with only a few weeks of forced training to prepare him for the event. One should first spend several months in systematic physical culture to strengthen the muscles, tendons, ligaments and all of the structures of the body.

Before specializing in any branch of athletics, you should try to become a good all-around man. You will then be able to specialize more successfully. If interested in running, you should develop your upper body as well as your legs. For sprinting, indeed, it is absolutely necessary to have a strong upper body. Successful sprinters are invariably men of superb build throughout. If interested in pole vaulting or weight throwing, it is especially important that you should first gain a perfect development of the upper body, preferably through wrestling and work on gymnastic apparatus.

I can not say too much in favor of a preliminary course of cross-country running, no matter what your intended specialty. If you plan to take up track athletics in the spring of the year, you should start cross-country work in the fall and continue through the winter. It will give you the foundation of endurance and organic strength that you need. Even cross-country work should be taken up gradually. The best plan in the beginning is to jog easily until tired, walk a short distance, then run a little more, and so on. You will soon find that you can run two or three miles at an easy pace without being tired.

Assuming that the young athlete is in sound physical condition in the early spring, a period of specialized training of eight to ten weeks is sufficient to get him in shape for competition. It is not wise to continue hard training longer than this. The unusually vigorous work involved in preparing one for the greatest effort of which he is capable, cannot be continued the year round without a rest. In other words, one cannot expect to retain his highest form continuously because the hard training required would be too exhausting. After two or three months of it one needs a rest. If you wish to undertake athletic contests from time to time throughout the year, the best plan is to keep in fairly good form with short periods of training, of perhaps three or four weeks at a time, and intervals of rest of from one to three weeks.

Going "stale" is the dread of all athletes. It is simply the result of excessive training. The nervous system has been exhausted. There is loss of energy, loss of appetite, inability to work and sometimes difficulty in sleeping, all signs of nervous depletion. At the first indications of going stale, the athlete should stop all exercise and sleep as much as possible. But there is no need of going stale if one trains properly.

Over-training is the one almost universal tendency of all young athletes. It is the natural result of the enthusiasm and ambition of youth. Don't be afraid, therefore, that you will be under-trained. The amount of work required varies with individuals. The heavy and phlegmatic types will require a longer period of training and can stand more work than the wiry, nervous type of athlete.

Practically all athletes follow the plan of training every day. But it does not follow that this is always the best plan. It may suit your case, or it may not. Where one's training calls for hard and exhausting work to develop unusual endurance, it may be best to train every other day. In yet other cases, it may be found advantageous to do hard work and light work on alternate days.

We must remember that there are two phases of conditioning. On the one hand there is the work or effort necessary to increase strength. And in the second place there is the element of recuperation, which is equally as important. Unless recuperation is absolutely perfect following one's exertions, he will not benefit or improve as he should. It is in just this respect that many athletes go wrong.

If you are doing a small amount of fast work, as in training for the sprints, daily training will be best, for the reason that you will be able to recuperate perfectly in twenty-four hours. But if you are training for a ten-mile run, a wrestling bout which may extend over an hour or two, or a twenty-round boxing match, you will have to do a great deal of hard work in order to prepare yourself for the prolonged exertion of the contest. To do so much hard work every day would be exhausting. You may need perhaps two or three days in order to recuperate from your exertions in training. Therefore, in some instances, a schedule of training two or three times a week might be more satisfactory than daily work in preparing for events that require great exertion and prolonged endurance.

The result of muscular exertion is the production of waste known as fatigue-poisons. Stiffness and soreness of the muscles are due to an excess of these waste-products. If you find yourself slow in a contest, it does not necessarily mean that you have not done enough training. It may mean that you have done too much, and that your tissues are still choked with these waste-poisons. They deprive you of your strength and speed. You may then find that if you train less frequently, allowing for more perfect recuperation in the intervals between your exertions, you will improve much faster.

It is for this reason that track athletes rest one or two days or even more before a race. It enables them to accumulate energy. And any stiffness incidental to hard training is allowed to wear off. The athlete enters the contest with his muscles literally clean and fresh.

In view of this, it is very curious indeed that practically without exception professional boxers insist on do-air. All of these things provide a variety of activity for all parts of the body, which tends to develop an exceptionally capable all around physique. There is no finer group of men in the world than American professional baseball players.

There is another feature of the exercise involved in a ball game that is extremely important, and that is the physiologically advantageous distribution of one's exertions throughout the course of the nine innings. While the activity of each player when in action is strenuous and fast, nevertheless there are intervals of relaxation which permit of easy recuperation, so that one may continue at his best throughout the entire game and finish without unusual fatigue. There are some forms of sport, as in basketball for instance, in which the activity is fast and continuous. Such work, although favorable to endurance, may be found exhausting to one not well trained for it. Baseball, however, makes no such demands upon one. Even if not in the pink of condition, one can "get away with it." One of the first principles of scientific physical training is found in the alternation of contraction and relaxation of the muscles. In baseball, there are moments of the utmost activity for each player, but there are also intermittent periods of inactivity, either while he is waiting for his turn at bat or when in the field waiting for something to happen. These rest intervals keep the player fresh. They make possible the high attainment of energy, co-ordination and skill which is found in professional baseball.

There is only one way to get the greatest benefit from a ball game, and that is to get into the game yourself. It does not matter how poorly you play, so long as you are able to get the exercise and the fun. If you can do no better, do a little ball playing in your back yard or the empty lot near by. Don't think that you must be a near-professional in order to get the enjoyment and benefit. It is better to be a "dub," and to play such a game as you can, than only to go and *see* the experts play.

This is not said to condemn the baseball fan. It will do you good even to see a ball game; first, because of the fresh air secured, and second, because of the mental relaxation already mentioned. Just the same, the eighteen men on the diamond are getting more out of it than you are at that (physically as well as financially). It is a good plan to see the crack players once in a while, for you will then enjoy playing the game yourself all the more, through your stimulated interest. On the other hand, if you actually dabble in the game yourself, you will enjoy all the more keenly the experience of playing the game by proxy when the professional players line up.

Now as to football—is it worth while? It is a rough, strenuous, body-bruising, and sometimes even bone-breaking game. It is the most vigorous and violent form of activity known in modern life, outside of war. It is indeed even more exacting than war in its demand for rugged strength and superb physical condition.

Football is our one great national autumn sport, of all-absorbing interest to young America. Meanwhile, thousands of parents are forbidding their sons to play it, and many schools are considering its abolition. What, then, should be the attitude of the young man and of his parents towards this gruelling game?

Irrespective of the dangers—such as they are—the occasional abuses, and any other drawbacks associated with a game of this kind, there must still be something extraordinarily vital in football to enable it to gain the hold upon the nation that it has attained. There must be some qualities of a fundamental and irresistible nature to give this pastime its all-absorbing fascination.

First of all, football has all of the qualities of speed, physical activity, strenuous exertion, skill, dexterity, and the interest of competition which enter into so many other pastimes and make them attractive and popular. But football has also the element of the heroic. It places a special premium upon the qualities of courage, fortitude, pluck and other elements of character that go toward the making of that which is best in manhood. Football is not a game for the physical weakling, but also it is not a game for the moral weakling. The youth with a "yellow streak" has no place upon the gridiron. It is a game which calls not only for physical hardihood, but also for that hardihood of spirit which constitutes a nation's greatest asset. It is a game "for men only"—real men—men in the making.

It is true that football involves to some extent the risk of one's skin, both literally and figuratively. It is quite true that football players sometimes actually do leave small patches of their cutaneous surface upon the field. It is even true that in exceptional cases a bone may snap. The objection to football chiefly rests in these possibilities and dangers. But just there also is to some extent the merit of the game, so far as its spiritual and moral influence is concerned. It is this very element of risk, however slight, that makes this a game that calls for courage, that develops spunk, that helps to build the finer elements of our young manhood.

It is true that the risk is not a great one. It should not be too great in any form of sport. But it is there, and every football player knows it. It can not be said that young men enter into this game unconscious of the slight element of danger. They know it just as keenly as their parents. But they ignore it, and in so doing they show the stuff that men are made of. Scraped skin will grow again. Even broken bones will mend in a few weeks. And even though one suffers a temporary inconvenience of this kind, yet the total value from a physical standpoint, to say nothing of the character-building influence, is such that the physical gain will far outweigh the hurts. On the other hand, the delicate flesh, the tender skin and the frail body of the effeminate youth who shrinks from football, has probably a far greater chance of being destroyed through the wasting processes of disease than the football player has of coming to any truly serious injury through rough usage of this kind.

In a way, the question of football crystallizes the question as to whether a soft, sheltered life is to be preferred to the school of "hard knocks" in the building of either the body or the character. The question is paralleled by the comparative methods of training in each of two young children we have known, between two or three years of age. Both could walk, both wanted to run. Percival's mother said, "Don't run, Percy, you'll fall." Tom's mother said, "Go out now, Tommy, and run all you like," and she turned him loose to chase over the rocks and ditches with the bigger boys. Tommy bruised

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WHY is baseball our most popular game? Why do we like to play it, and like to see it?

Millions of boys and men play ball each year. Tens of millions are fans. They play it by proxy. Why?

There are two main factors in the game of baseball. There is exercise. And there is mental relaxation.

Perhaps one may question the latter statement. The intensity of interest, the high-strung excitement, the absorbing concentration in the progress of the game, may not appear to be a state of relaxation. And yet it is because the interest in the game is so engrossing that it affords the most complete mental relaxation so far as the other brain centers are concerned.

The game of baseball has a highly dramatic quality in so far as there is developed a state of almost breathless suspense, owing partly to the partisanship of the spectator and the element of conflict between the opposing teams. Which side will win? Will the one team hold its lead? What will happen next? Will he hit it? Will he reach home? But punctuating the suspense of the contest at uncertain intervals is a series of stirring and sensational episodes full of speed, action and intense exertion upon the part of highly trained and skilled athletes. Apart from the exercise involved, and the natural pleasure for the spectator in observing the demonstrations of skill, agility and strength on the part of the players, there is this element of drama that accounts very largely for the fascination of the great American game.

All this means mental relaxation. The mind, for the time being, is given up largely to feeling rather than thinking. There is partisanship, excitement, enthusiasm, discouragement, hilarious joy, and withering scorn for the umpire. Now, emotion is far more primitive than thought. A creature that can not think may be able to feel a great deal. And the mere shifting of the mind from the field of thought to the realm of the emotions involves a relaxation of those higher brain centers which are so often compelled to work overtime by the requirements of civilization. In other words, baseball, with all its frenzy of feeling, means relaxation for the thinking brain, and is welcomed as such by the tired business man or professional worker.

Psychologists of the present day have pointed out that those activities which we regard as play and recreation are invariably allied with the life pursuits of primitive man. These activities rest us because they are easy. They involve no nerve strain. The higher intellectual faculties are of more recent development and are more easily fatigued. But the brain centers employed in primitive activities are well established. They are well developed in children. And the minds of children are on a level with those of the savage. Consequently, the man of today finds recreation in sports which practically duplicate the life history of the man of long ago.

The primary features of a baseball game represent three fundamental forms of activity in the life of primitive man; namely, running, throwing and striking. The savage who did not excel in all three of these branches of physical endeavor was a very poor representative of his kind. Whether in baseball or in other games, all children naturally take a special interest in striking, throwing, and running. Baseball in these respects reawakens in us the old life of our long-removed forefathers.

It is true that the element of skill adds to the interest of a ball game, but apart from this the mere physical activity is of a kind that one will enjoy. The exercise is also of a character that is valuable for building up an all around athletic body. Take any young man who is unusually good in baseball, and you can depend upon finding a good, all around physique. It takes muscular efficiency and co-ordination of a high order to play baseball well, but continued practice in the game will also build the muscular power and perfect control of all parts of the body that characterize the men in the big leagues.

Consider merely the throwing of the ball. At first thought one may suppose that he simply throws a ball with his right arm, and that it requires only a good, strong arm. But this is not true. The person who attempted to throw with the arm alone would make an exceedingly poor performance. You need only to study the action of a good pitcher to appreciate the extent to which the muscles of the trunk of the body are brought into play. So far as the arm alone is concerned, the muscles of the upper chest are very largely involved in bringing this member forward. But the great force of the throw is derived to a large extent from the twisting or turning action of the entire trunk, as the right shoulder swings forward in the act of throwing. Considered from the standpoint of the backbone alone, the rotation of the spine in the act of throwing is such as to loosen up the vertebrae and to keep this remarkable structure supple and active. Study the action of a good throw in your own person. Study out the muscles involved and the amount of action for the entire body, and you may be surprised to realize just how much exercise is involved in it.

Very much the same thing may be said of batting. One's first impression is that he wields a bat mainly with the arms, but this is far from true. In the case of batting, the trunk of the body is even more effectively employed than in throwing. In fact, if ever you desire a good exercise for the spine in the form of rotating the vertebrae and vigorously using the muscles of the trunk, an imitation of the batting action could scarcely be improved upon.

The running involved in a baseball game is the very best kind of exercise for the reason that base running means sprinting. It calls for concentrated exertion of the muscles of almost the entire body. Running is primarily an exercise for the legs, but one does not run with the legs alone. At least in sprinting there must be vigorous co-ordination of the muscles of the upper body, including the arms. Each muscle-group must contribute its part towards realizing the amount of power and muscular swing involved in good running.

The stopping and catching of a ball involve a further development of muscular co-ordination. It means bending and stooping, reaching to one side or the other, or, as the case may require, perhaps leaping high into the throwing and the like. The other phase of training relates purely to physical condition, that is to say, to the combination of strength, energy and endurance which make it possible for one to use his skill effectively. We will discuss only this aspect of training here.

We will pass by the subject of diet. That which is best to maintain strength and health in ordinary life is also best for athletic purposes. Certainly it is not wise to make any sudden changes in one's food on the theory that training calls for a special diet. At the same time, all dietetic abuses should positively be discontinued. And it is well to remember that one should not attempt to do any hard athletic work except on an empty stomach, that is to say, not within three or four hours after eating. The general health requirements, such as bathing, sleep and fresh air, are taken for granted.

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Before specializing in any branch of athletics, you should try to become a good all-around man. You will then be able to specialize more successfully. If interested in running, you should develop your upper body as well as your legs. For sprinting, indeed, it is absolutely necessary to have a strong upper body. Successful sprinters are invariably men of superb build throughout. If interested in pole vaulting or weight throwing, it is especially important that you should first gain a perfect development of the upper body, preferably through wrestling and work on gymnastic apparatus.

I can not say too much in favor of a preliminary course of cross-country running, no matter what your intended specialty. If you plan to take up track athletics in the spring of the year, you should start cross-country work in the fall and continue through the winter. It will give you the foundation of endurance and organic strength that you need. Even cross-country work should be taken up gradually. The best plan in the beginning is to jog easily until tired, walk a short distance, then run a little more, and so on. You will soon find that you can run two or three miles at an easy pace without being tired.

Assuming that the young athlete is in sound physical condition in the early spring, a period of specialized training of eight to ten weeks is sufficient to get him in shape for competition. It is not wise to continue hard training longer than this. The unusually vigorous work involved in preparing one for the greatest effort of which he is capable, cannot be continued the year round without a rest. In other words, one cannot expect to retain his highest form continuously because the hard training required would be too exhausting. After two or three months of it one needs a rest. If you wish to undertake athletic contests from time to time throughout the year, the best plan is to keep in fairly good form with short periods of training, of perhaps three or four weeks at a time, and intervals of rest of from one to three weeks.

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Practically all athletes follow the plan of training every day. But it does not follow that this is always the best plan. It may suit your case, or it may not. Where one's training calls for hard and exhausting work to develop unusual endurance, it may be best to train every other day. In yet other cases, it may be found advantageous to do hard work and light work on alternate days.

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If you are doing a small amount of fast work, as in training for the sprints, daily training will be best, for the reason that you will be able to recuperate perfectly in twenty-four hours. But if you are training for a ten-mile run, a wrestling bout which may extend over an hour or two, or a twenty-round boxing match, you will have to do a great deal of hard work in order to prepare yourself for the prolonged exertion of the contest. To do so much hard work every day would be exhausting. You may need perhaps two or three days in order to recuperate from your exertions in training. Therefore, in some instances, a schedule of training two or three times a week might be more satisfactory than daily work in preparing for events that require great exertion and prolonged endurance.

The result of muscular exertion is the production of waste known as fatigue-poisons. Stiffness and soreness of the muscles are due to an excess of these waste-products. If you find yourself slow in a contest, it does not necessarily mean that you have not done enough training. It may mean that you have done too much, and that your tissues are still choked with these waste-poisons. They deprive you of your strength and speed. You may then find that if you train less frequently, allowing for more perfect recuperation in the intervals between your exertions, you will improve much faster.

It is for this reason that track athletes rest one or two days or even more before a race. It enables them to accumulate energy. And any stiffness incidental to hard training is allowed to wear off. The athlete enters the contest with his muscles literally clean and fresh.

In view of this, it is very curious indeed that practically without exception professional boxers insist on doing the very hardest training up to the very day before a contest. When you see an ordinarily brilliant and clever boxer fail to do himself justice, when he seems slow and lacking in his customary energy, it is far more often the result of over-training than of under-training. A rest of two days would probably have made all the difference in the world. A rest of a week is sometimes advantageous. Championships have been lost through this simple mistake in training.

It is true that boxers continue the severe training grind up to the last day partly because of the necessity of "making weight," that is to say, scaling down to a stipulated weight on the day of the contest. But there is no advantage in overworking up to the last day, thus choking the body with fatigue-poisons and making the muscles slow and stiff, when a reduction of the food supply or even a complete fast of one or two days would more easily take care of the weight question. A fast of a day or two will not weaken a well-nourished athlete. It would be far better to enter a contest with an exceedingly empty stomach but with muscles clean and fresh than to be well fed but with muscles slow and stiff from fatigue. In any case, warm baths and massage will go far to relieve such stiffness.

Running one hundred yards properly requires a tremendous amount of strength and energy. One should not attempt it during the first three or four weeks of training. A few starts each day, and running perhaps one hundred and fifty yards at a good swinging stride, or "three-quarters speed," would be sufficient for a day's work in the beginning, with some easy jogging.

Thorough bodily warmth before attempting any athletic exertion is important, especially in the early spring, when the weather is raw and chilly. It is well to do considerable jogging or dancing in a good sweater, and clad in warm trousers, to get the muscles thoroughly warmed up before attempting any sprints. This warming-up also applies to competition.

There is danger of serious injury from violent use of the muscles when cold and stiff. It is also important when sprinting hard to slow down easily, to avoid strains. Don't pull up short and try to stop quickly.

The daily practice of hurdling or broad-jumping is not always the best preparation for these events. Success really depends on speed, and this is best gained by the daily practice of sprinting, trying the hurdles or the jumps only two or three times a week. In the same way it is not desirable to undergo the strain of pole vaulting every day. Exercise on gymnastic apparatus can often be advantageously substituted for the pole vaulting. Any strain calls for complete rest.

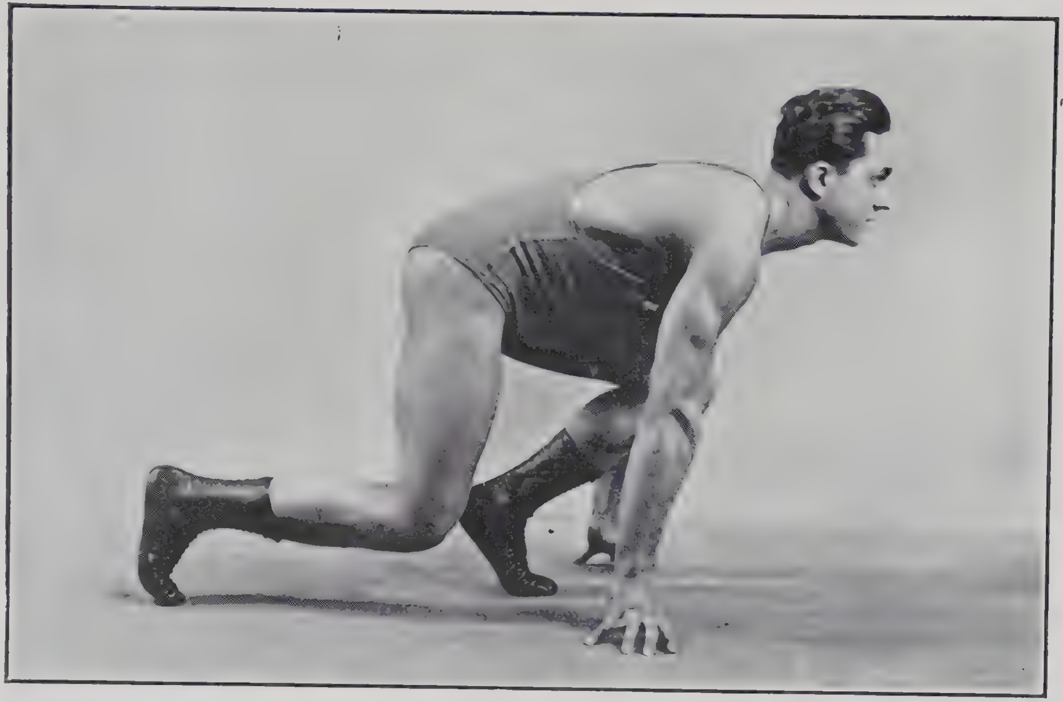
In training for distance work, there are two elements to be considered, strength and endurance. Speed depends upon strength, and also develops strength. For this reason the distance runner should do a certain amount of fast work. One should not expect to run the distance for which he is training each day in practice. His purpose should be merely to do such work from day to day as will enable him to run that distance at his best on the day of the prospective competition. If one is training for a mile run, for instance, he should start out to build endurance by running at a fairly comfortable pace a distance considerably greater than a mile. But also, perhaps on alternate days, he should do some fast running. To run a quarter of a mile much faster than the speed at which one expects to run a mile race, will tend to develop the strength to maintain the mile pace easily. After three or four weeks of training, one may be able to run a half or three-quarters of a mile at a pace approximating that which he must expect to follow in running the mile race. It is in this way that one gradually works up to the ultimate condition of fitness for competition. Similar principles of training apply to other distances.

So far as Marathon running is concerned, it would be much better for the average athlete to cover this distance by installments. Spread your Marathon over a week, taking three or four miles each day. Marathon running is a wonderful *test* of endurance, but a very poor way to attempt to *build* vitality. It is too great a drain upon the system. A few miles of cross-country running will be found an ideal means of building stamina and manhood. Cross-country work is commonly found to be a means of gaining weight. But Marathon running is too much of a good thing. Only those of mature years and long experience in distance running should attempt such a distance, for it will not hurt them.

It is a good plan for the young athlete to "make haste slowly." Don't imagine that you are going to accomplish wonders during your first season. As a rule, it takes three or four years of training and sometimes even longer participation before one begins to approach the best possible form of which he is capable. Do not force yourself too much. By so doing, you will only defeat your own purpose.

Particularly is this true in connection with boyhood athletics. Too much competition and training in high school may even prevent the realization of one's best possibilities in later years. Boys of sixteen or seventeen should not take athletics too seriously. They should only "play" at the game. Never mind the records. For boys under fifteen, it would be better to run sprints of only fifty yards, rather than one hundred. In relay races, teams of four boys should run only a half mile. Boys in their growing years should be content to grow. They should play all kinds of active games, and they should also participate in athletics to the extent of having as much fun as possible. But they should not try to compete against seasoned athletes.

Athletic sports are so valuable a means of maintaining bodily vigor and energy that they should be continued into middle age. The greatest mistake of the athlete is suddenly to break off his activities and settle down to an inactive, sedentary life. The man or woman once muscularly well developed finds it a simple matter to retain this development. We should not only approve of athletics for the youth of the country, but we should strive for an ideal physical condition of mature men.



The correct running start is essential in many forms of track athletics. The position shown is ideal for "getting set," the weight being supported not only by the front foot, but to a large extent by the arms, leaving the rear leg relaxed for the "push off."

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There are two main factors in the game of baseball. There is exercise. And there is mental relaxation.

Perhaps one may question the latter statement. The intensity of interest, the high-strung excitement, the absorbing concentration in the progress of the game, may not appear to be a state of relaxation. And yet it is because the interest in the game is so engrossing that it affords the most complete mental relaxation so far as the other brain centers are concerned.

The game of baseball has a highly dramatic quality in so far as there is developed a state of almost breathless suspense, owing partly to the partisanship of the spectator and the element of conflict between the opposing teams. Which side will win? Will the one team hold its lead? What will happen next? Will he hit it? Will he reach home? But punctuating the suspense of the contest at uncertain intervals is a series of stirring and sensational episodes full of speed, action and intense exertion upon the part of highly trained and skilled athletes. Apart from the exercise involved, and the natural pleasure for the spectator in observing the demonstrations of skill, agility and strength on the part of the players, there is this element of drama that accounts very largely for the fascination of the great American game.

All this means mental relaxation. The mind, for the time being, is given up largely to feeling rather than thinking. There is partisanship, excitement, enthusiasm, discouragement, hilarious joy, and withering scorn for the umpire. Now, emotion is far more primitive than thought. A creature that can not think may be able to feel a great deal. And the mere shifting of the mind from the field of thought to the realm of the emotions involves a relaxation of those higher brain centers which are so often compelled to work overtime by the requirements of civilization. In other words, baseball, with all its frenzy of feeling, means relaxation for the thinking brain, and is welcomed as such by the tired business man or professional worker.

Psychologists of the present day have pointed out that those activities which we regard as play and recreation are invariably allied with the life pursuits of primitive man. These activities rest us because they are easy. They involve no nerve strain. The higher intellectual faculties are of more recent development and are more easily fatigued. But the brain centers employed in primitive activities are well established. They are well developed in children. And the minds of children are on a level with those of the savage. Consequently, the man of today finds recreation in sports which practically duplicate the life history of the man of long ago.

The primary features of a baseball game represent three fundamental forms of activity in the life of primitive man; namely, running, throwing and striking. The savage who did not excel in all three of these branches of physical endeavor was a very poor representative of his kind. Whether in baseball or in other games, all children naturally take a special interest in striking, throwing, and running. Baseball in these respects reawakens in us the old life of our long-removed forefathers.

It is true that the element of skill adds to the interest of a ball game, but apart from this the mere physical activity is of a kind that one will enjoy. The exercise is also of a character that is valuable for building up an all around athletic body. Take any young man who is unusually good in baseball, and you can depend upon finding a good, all around physique. It takes muscular efficiency and co-ordination of a high order to play baseball well, but continued practice in the game will also build the muscular power and perfect control of all parts of the body that characterize the men in the big leagues.

Consider merely the throwing of the ball. At first thought one may suppose that he simply throws a ball with his right arm, and that it requires only a good, strong arm. But this is not true. The person who attempted to throw with the arm alone would make an exceedingly poor performance. You need only to study the action of a good pitcher to appreciate the extent to which the muscles of the trunk of the body are brought into play. So far as the arm alone is concerned, the muscles of the upper chest are very largely involved in bringing this member forward. But the great force of the throw is derived to a large extent from the twisting or turning action of the entire trunk, as the right shoulder swings forward in the act of throwing. Considered from the standpoint of the backbone alone, the rotation of the spine in the act of throwing is such as to loosen up the vertebrae and to keep this remarkable structure supple and active. Study the action of a good throw in your own person. Study out the muscles involved and the amount of action for the entire body, and you may be surprised to realize just how much exercise is involved in it.

Very much the same thing may be said of batting. One's first impression is that he wields a bat mainly with the arms, but this is far from true. In the case of batting, the trunk of the body is even more effectively employed than in throwing. In fact, if ever you desire a good exercise for the spine in the form of rotating the vertebrae and vigorously using the muscles of the trunk, an imitation of the batting action could scarcely be improved upon.

The running involved in a baseball game is the very best kind of exercise for the reason that base running means sprinting. It calls for concentrated exertion of the muscles of almost the entire body. Running is primarily an exercise for the legs, but one does not run with the legs alone. At least in sprinting there must be vigorous co-ordination of the muscles of the upper body, including the arms. Each muscle-group must contribute its part towards realizing the amount of power and muscular swing involved in good running.

The stopping and catching of a ball involve a further development of muscular co-ordination. It means bending and stooping, reaching to one side or the other, or, as the case may require, perhaps leaping high into the air. All of these things provide a variety of activity for all parts of the body, which tends to develop an exceptionally capable all around physique. There is no finer group of men in the world than American professional baseball players.

There is another feature of the exercise involved in a ball game that is extremely important, and that is the physiologically advantageous distribution of one's exertions throughout the course of the nine innings. While the activity of each player when in action is strenuous and fast, nevertheless there are intervals of relaxation which permit of easy recuperation, so that one may continue at his best throughout the entire game and finish without unusual fatigue. There are some forms of sport, as in basketball for instance, in which the activity is fast and continuous. Such work, although favorable to endurance, may be found exhausting to one not well trained for it. Baseball, however, makes no such demands upon one. Even if not in the pink of condition, one can "get away with it." One of the first principles of scientific physical training is found in the alternation of contraction and relaxation of the muscles. In baseball, there are moments of the utmost activity for each player, but there are also intermittent periods of inactivity, either while he is waiting for his turn at bat or when in the field waiting for something to happen. These rest intervals keep the player fresh. They make possible the high attainment of energy, co-ordination and skill which is found in professional baseball.

There is only one way to get the greatest benefit from a ball game, and that is to get into the game yourself. It does not matter how poorly you play, so long as you are able to get the exercise and the fun. If you can do no better, do a little ball playing in your back yard or the empty lot near by. Don't think that you must be a near-professional in order to get the enjoyment and benefit. It is better to be a "dub," and to play such a game as you can, than only to go and *see* the experts play.

This is not said to condemn the baseball fan. It will do you good even to see a ball game; first, because of the fresh air secured, and second, because of the mental relaxation already mentioned. Just the same, the eighteen men on the diamond are getting more out of it than you are at that (physically as well as financially). It is a good plan to see the crack players once in a while, for you will then enjoy playing the game yourself all the more, through your stimulated interest. On the other hand, if you actually dabble in the game yourself, you will enjoy all the more keenly the experience of playing the game by proxy when the professional players line up.

Now as to football—is it worth while? It is a rough, strenuous, body-bruising, and sometimes even bone-breaking game. It is the most vigorous and violent form of activity known in modern life, outside of war. It is indeed even more exacting than war in its demand for rugged strength and superb physical condition.

Football is our one great national autumn sport, of all-absorbing interest to young America. Meanwhile, thousands of parents are forbidding their sons to play it, and many schools are considering its abolition. What, then, should be the attitude of the young man and of his parents towards this gruelling game?

Irrespective of the dangers—such as they are—the occasional abuses, and any other drawbacks associated with a game of this kind, there must still be something extraordinarily vital in football to enable it to gain the hold upon the nation that it has attained. There must be some qualities of a fundamental and irresistible nature to give this pastime its all-absorbing fascination.

First of all, football has all of the qualities of speed, physical activity, strenuous exertion, skill, dexterity, and the interest of competition which enter into so many other pastimes and make them attractive and popular. But football has also the element of the heroic. It places a special premium upon the qualities of courage, fortitude, pluck and other elements of character that go toward the making of that which is best in manhood. Football is not a game for the physical weakling, but also it is not a game for the moral weakling. The youth with a "yellow streak" has no place upon the gridiron. It is a game which calls not only for physical hardihood, but also for that hardihood of spirit which constitutes a nation's greatest asset. It is a game "for men only"—real men—men in the making.

It is true that football involves to some extent the risk of one's skin, both literally and figuratively. It is quite true that football players sometimes actually do leave small patches of their cutaneous surface upon the field. It is even true that in exceptional cases a bone may snap. The objection to football chiefly rests in these possibilities and dangers. But just there also is to some extent the merit of the game, so far as its spiritual and moral influence is concerned. It is this very element of risk, however slight, that makes this a game that calls for courage, that develops spunk, that helps to build the finer elements of our young manhood.

It is true that the risk is not a great one. It should not be too great in any form of sport. But it is there, and every football player knows it. It can not be said that young men enter into this game unconscious of the slight element of danger. They know it just as keenly as their parents. But they ignore it, and in so doing they show the stuff that men are made of. Scraped skin will grow again. Even broken bones will mend in a few weeks. And even though one suffers a temporary inconvenience of this kind, yet the total value from a physical standpoint, to say nothing of the character-building influence, is such that the physical gain will far outweigh the hurts. On the other hand, the delicate flesh, the tender skin and the frail body of the effeminate youth who shrinks from football, has probably a far greater chance of being destroyed through the wasting processes of disease than the football player has of coming to any truly serious injury through rough usage of this kind.

In a way, the question of football crystallizes the question as to whether a soft, sheltered life is to be preferred to the school of "hard knocks" in the building of either the body or the character. The question is paralleled by the comparative methods of training in each of two young children we have known, between two or three years of age. Both could walk, both wanted to run. Percival's mother said, "Don't run, Percy, you'll fall." Tom's mother said, "Go out now, Tommy, and run all you like," and she turned him loose to chase over the rocks and ditches with the bigger boys. Tommy bruised his limbs, but became sure-footed, sturdy and self-reliant. Percy became weak-kneed, timid, a cry baby, and so uncertain of footing that one day he fell downstairs and broke his arm.

Football is not a thing foisted upon the American youth by some outside influence. One great truth about it is that it is purely an expression of the spirit of American youth, and it is an occasion for national congratulation that this should be so. When we have reached a state of white-livered, jelly-spined, characterless national spirit such that our young people no longer plunge instinctively into strenuous, hardy and red-blooded pastimes of this kind, then indeed will we have occasion to complain of the character of our sports. The young man who is physically rugged and fitted for a pastime of this kind, but who is afraid of a little rough sport, should be ashamed of himself. And the parent of a stoutboned, robust youth who shrinks from the amateur hardships of the gridiron would have good reason to be ashamed of his offspring.

The same consideration applies to a certain extent to athletic training in other branches of sport. Dyspeptic doctors, flat-chested professors, anemic clergymen and weak-kneed editors everywhere are in the practice of condemning athletics. "Athletics will enlarge the heart," they say, ignoring the fact that the typical athletic heart is only a bigger, more powerful and better heart than that of the average man. Also, you may hurt yourself or strain yourself in one way or another, according to these wise ones. "Don't run, Percy, you'll fall." But what, indeed, would become the standard of American life if ideals and counsels of this kind could be forced upon our young people? Into what kind of a nation would we develop? Is it not rather our national duty to encourage all forms of interest and activity that promote the building of greater physical hardihood and vigor?

If my son at the age of twenty is organically sound, and yet unable to run a few miles cross-country, or unable to make a creditable showing in a wrestling bout, boxing bout or game of football, I shall feel thoroughly ashamed of him, and will regard myself as having failed grievously in my responsibilities as a parent.

It is not simply that football appeals to the primitive in us; not alone that it awakens within our natures something of the supposedly outgrown spirit of physical struggle and combat developed in our cave-man and stone-age ancestors. Such considerations may indeed be somewhat explanatory of the interest in the game. But the real value of football lies in the fact that it fosters the elements of courage, heroism, pluck, self-restraint, discipline, the power of quick thinking, decision, initiative, persistence and other qualities of mind and spirit which are as necessary in modern life as ever before. There is too great a tendency to regard our sports as merely channels of physical exercise. Their educational influence in the building of character, in developing some of the more valuable qualities of the mind and spirit, is too commonly overlooked.

LEARNING TO SWIM

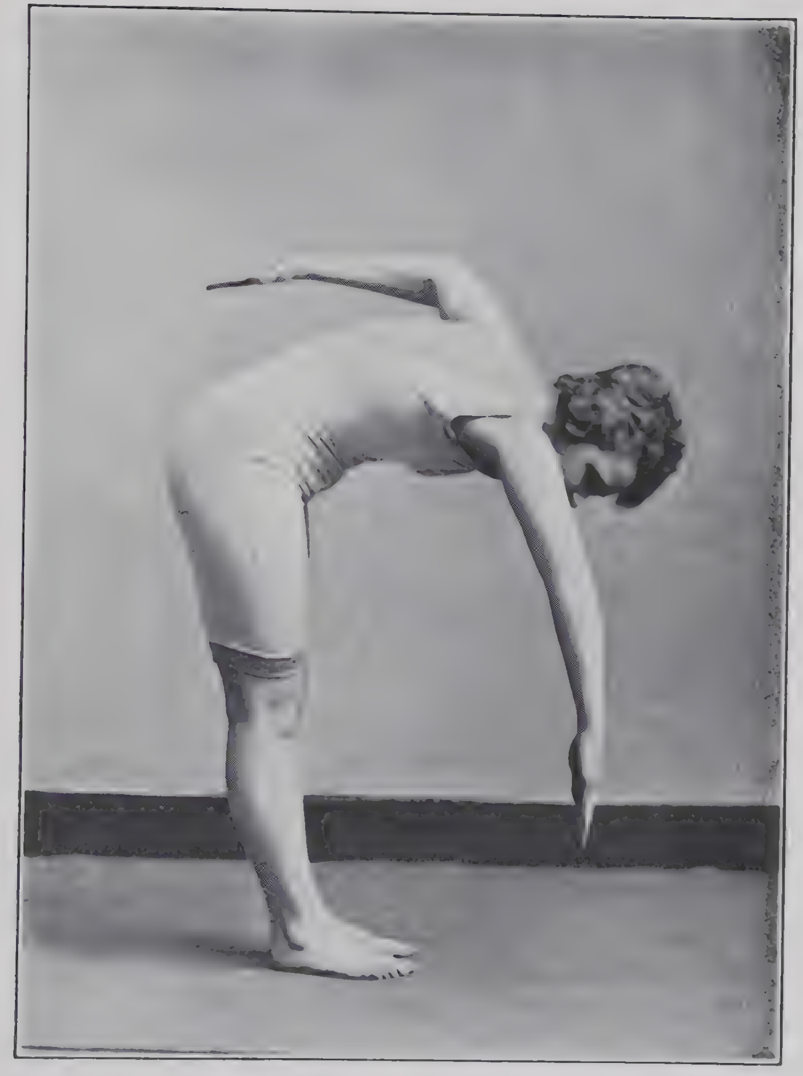
By G. H. CORSAN

MEN and monkeys are the only animals that have to learn to swim. All other mammals, from a mouse to a moose, can do it without learning. This is because they keep up a running motion in the water, with their bodies on a horizontal plane, whereas men and monkeys try to climb out of the water and grasp at the atmosphere. Swimming, however, once learned, is just as easy for human beings as it is for mice and moose, and it is not difficult to learn.

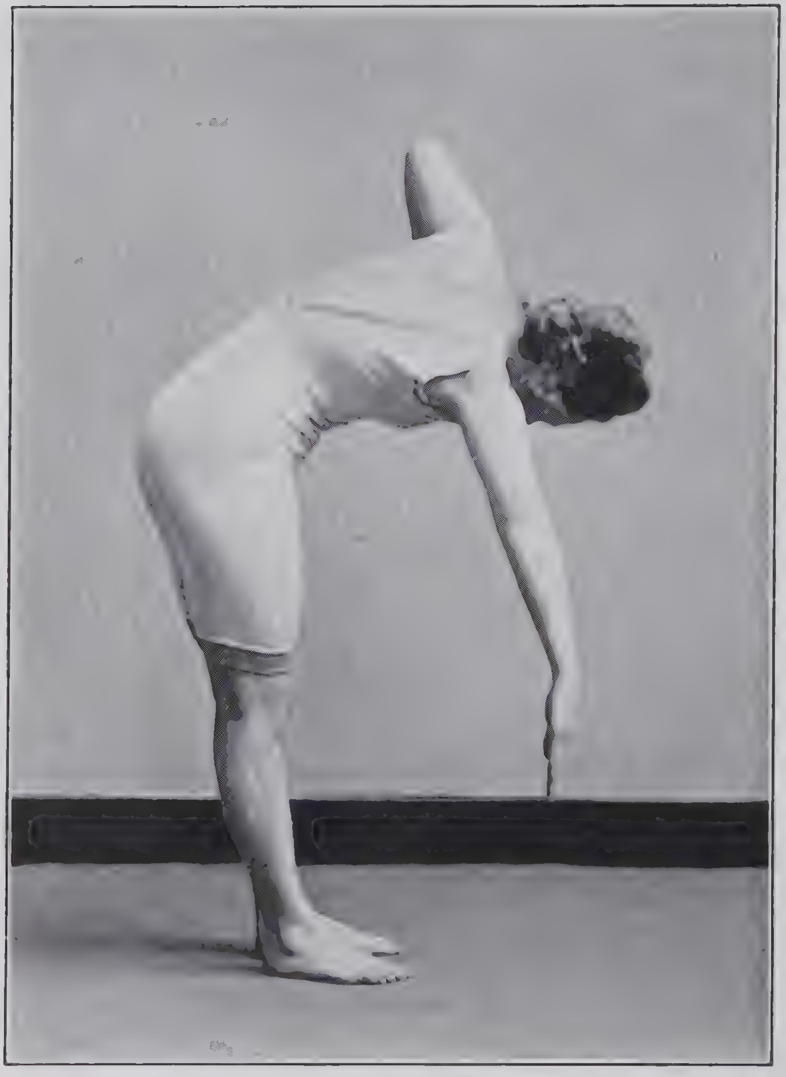
The art of swimming is really very simple. There are only three things to learn, the arm work, the leg work and the breathing. The trouble is that most beginners want to acquire all three at once. This is as if a person learning to play the piano should try to play a musical composition before he had mastered the notation or learned the control of his fingers. Neither a musician nor a swimmer can be made in that way. But if you tackle the details of the natatorial technique separately, they will give you but little trouble, and you will soon be able to combine them and swim with grace and style, also with speed and safety. In that case you need never fear that the statement will be made of you that you lost your life because you were an expert swimmer, an absurd idea that one meets frequently in the newspapers. No expert swimmer ever lost his life in the water except through chilling to death, or starving to death, or through some accident that had nothing to do with the loss of his ability to keep afloat and propel himself through the water. I believe that Captain Webb was thrown into the air some fifteen feet and came down on a rock on his head, an accident which would have killed him on land just as surely as in the water. It is possible, too, that he may have been smothered in the foam of the Niagara rapids. But occasionally I am inclined to suspect that he did not fully understand the art of rhythmic breathing, for as long as the swimmer can get air and avoid taking water into his lungs he is safe.

The first thing for the swimmer to do is to overcome his fear of the water, and this is the least of the difficulties which we have to overcome. Men fear the water for the same reason, largely, that the horse fears the automobile, because it is unfamiliar to them. The first time a horse sees an automobile he cannot even tremble with fear. He is rigid. The next time he trembles, and the third time he trembles less, until at last you can hardly keep him out of the way of the machines. It is the same way with fear of the water, if it is properly approached.

In the old days, many a father made the terrible mistake of throwing his boy into the water to make him swim. The practice is not extinct even today. If the father by accident throws the boy in horizontally, he will set up a violent dog paddle and struggle out of the water; but if the youngster is unfortunate enough to be thrown in perpendicularly, with his feet down, then you may be sure that when he has grown to be a gray-haired old man he will still tremble over that experience of his boyhood. Only a lazy father would seek thus to make a swimmer of his son. It requires mental effort to in-



Learn your swimming strokes first on dry land. This is the "crawl," the ideal modern stroke. Bend forward horizontally from the hips. The figure shows the right arm being brought back and the left arm being brought forward. (See next photo.)



In performing the crawl stroke, be sure that the elbow is drawn forward in advance of the forearm and hand, as in the preceding photo. This shows the left arm in the midway position. (See next photo.)

spire a pupil with confidence and turn him into a swimmer.

Fear of the water can be easily overcome, even in the most nervous, by the following method: Put a pair of water wings at the waistline, and get into warm, shallow water about two feet deep. Put the hands on the bottom, and then dog-paddle along the shore, every now and then putting the face under the water and blowing the air out of the lungs through the nose, the eyes being kept open. Keep the legs straight-stretched and together, then wiggle them in a kind of fish-tail action, making the water boil at the feet but not thrashing it. This is the Australian crawl kick or stroke.

The water wings I always use because they force the pupil into a horizontal position. In fact I generally place two pairs of water wings at the waistline. This forces the face to the water and the feet to the surface where I want them. It also gives the pupil confidence, for no human being, skillful or unskillful, can sink two pairs of water wings, and if the elbows are spread wide the subject cannot upset. The pupil is thus enabled to center his mind on the learning of the technique of swimming, the wild movements which the frightened beginner so often makes on first acquaintance with the water being eliminated. In learning the flutter kick, or crawl kick, a pair of water wings may be placed at the waistline and another in the hands in front lying flat on the water. In the old method of swimming in which the swimmer pushed against the water, instead of scooping it rearward, the pupil would sink when the wings were taken off. But when the crawl stroke is used no such difficulty is experienced. When the water wings are removed the pupil simply experiences a sense of relief, as the body glides through the water much more freely without the wings than with them.

I am continually being asked, "How long will it take me to learn the crawl stroke?" As human beings differ to an extraordinary extent both in structural parts and in capacity, this question can never be answered off hand. Some, in fact the majority, may learn in one week, or six continuous days, and there does not exist anyone who cannot learn in a month. I do not say that at the end of the week, or at the end of the month, all will be able to swim; but they will know how it should be done and will require nothing more but practice. Some may require days of practice, some weeks, some months. The hardest thing to overcome is structural awkwardness. Give me any day a stupid weak man to teach swimming rather than a stupid strong man. Many of the greatest athletes are very poor swimmers, for swimming is a rhythm, not a strenuous muscular action. That is one of the reasons why women often excel men in the water swimming being the one sport in which a woman can hold her own with a man.

Everyone should start swimming under a qualified coach, and no one is qualified to teach swimming if he teaches it merely for a living. The teacher must not only want his pupil to swim but be determined that he or she shall swim. This only must be the consideration in his mind, and not the fact that he will be paid for his work whether the pupil swims or not. But teachers are not picked up on every street corner, the idea that anyone who can swim can teach others to do so being an absurd mistake.

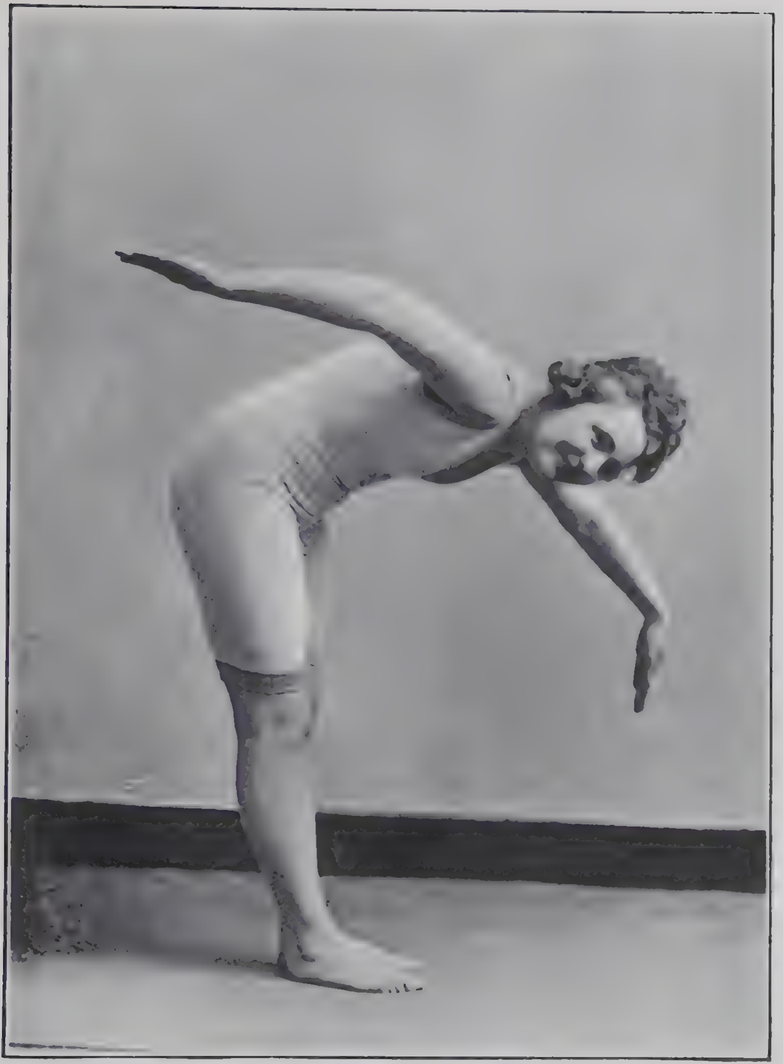
The mass system, in which many individuals are taught at once, in place of the old system of teaching one individual at a time, is a method that I have employed.

I find that if the water is warm, if the water is clear, and if the water is shallow, the team in mass will lose the fear of the water much sooner than if placed in the water singly. Three and a half to four feet is the ideal depth. The temperature of the water I must have warm. Eighty-one degrees is my preference. This makes complete relaxation possible, and relaxation is one of the secrets of the art of swimming.

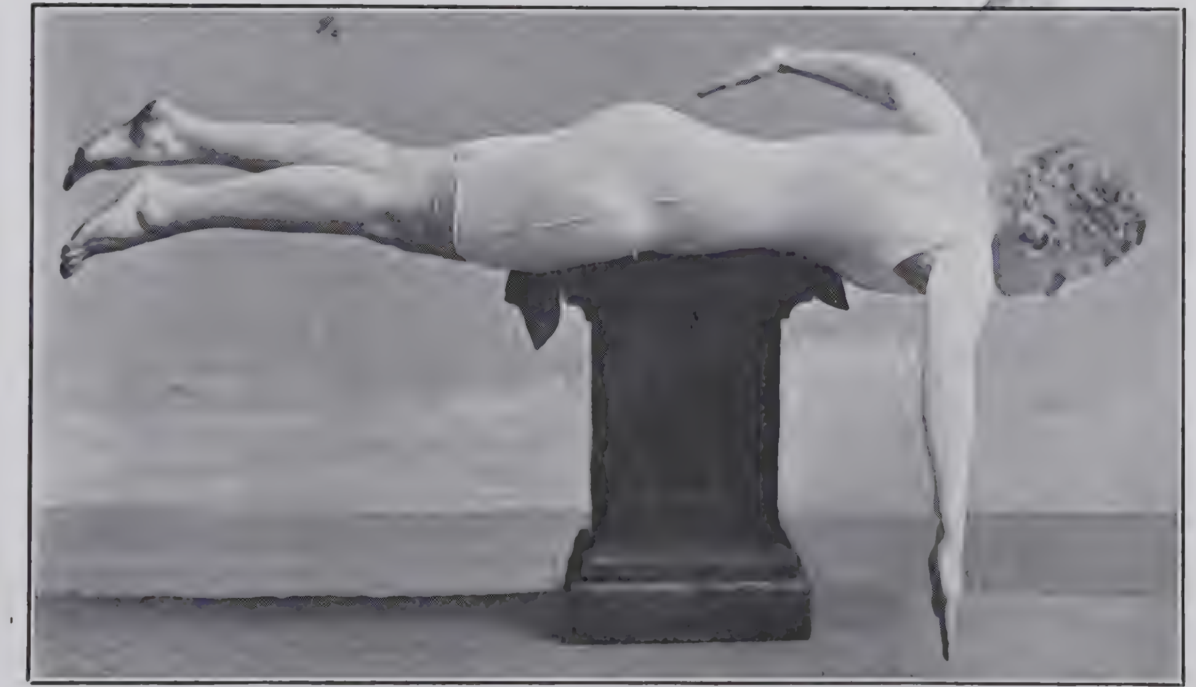
At the whistle the class can stand up and listen to the directions of the teacher, and the pupil who is still blowing air into his water wings can look on and learn from the mistakes of the others. On entering, the class will first learn breathing as follows: Stand up, open the mouth, take in air. Close the mouth, bend the knees and going down into the water exhale all the air through the nose, still keeping the mouth tightly closed. Stand up, open the mouth, take in air and repeat. The time for taking in air should be one second; the time for exhaling, ten seconds.

This system I have called rhythmic breathing, and it is the basic principle of the art of swimming. Failure to practice this kind of breathing is the cause of most drowning accidents, especially those commonly ascribed to cramps. A pain in the leg cannot possibly drown a person. He simply chokes to death because he does not breathe properly. When a drowning man pops up for a second to the surface of the water he will try to do two things—breathe out and breathe in; whereas if he had breathed out when he was under water all he would have had to do at the surface would have been to breathe in; and, as you have seen, breathing in takes only one second. You will readily understand, of course, the tremendous danger of breathing in under the water.

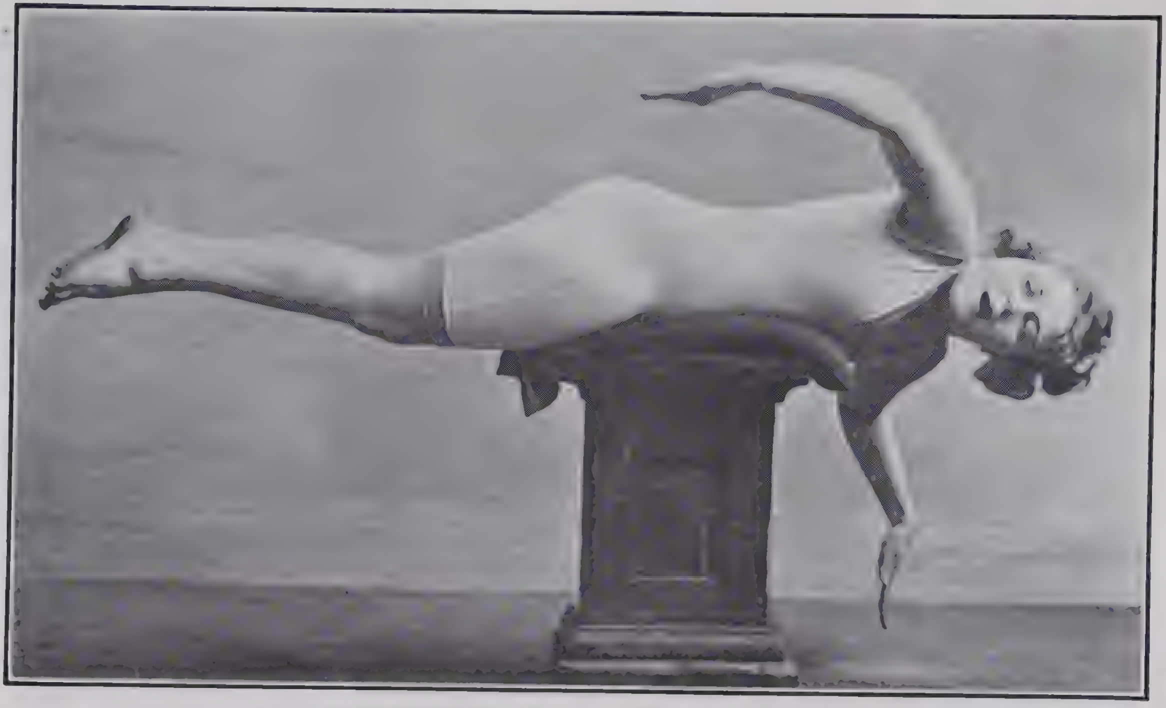
The arm work is the hardest single detail in the art of swimming, and it is a very good plan to start the pupil on the hardest work. The arm work for the Australian crawl and the trudgeon stroke is identical. The life-saving methods of swimming on the back, such as sculling, the broad stroke on the back and the alternate over-arms on the back, are to be taken up later on. For practice on arm work the legs are held straight together and allowed to drag. This is a difficult thing for the person who has already acquired some ragged leg action, and, by the way, ragged leg action is very often the cause of the drowning of so-called expert swimmers. Having the water wings at the waistline, as I have said, enables the pupil to center his mind upon the arm detail and get possession of his legs. The Australian crawl shoulder drill is the most difficult technical action to learn in the whole art of swimming, but most fortunately it may be practiced at home in the parlor or the kitchen even better that it can be in the water. The more it is practiced the better, for the pupil will find that long after his fear of the water has passed away his shoulder and arm action are still ragged and imperfect. The action in the shoulder drill is continuous, quiet, long, slow, wide, deep, and entirely confined to the shoulder muscle, except for a wrist and forearm bone twist. The arm action is the antithesis of the leg action. Those who are very tight at the shoulders and experience a difficulty



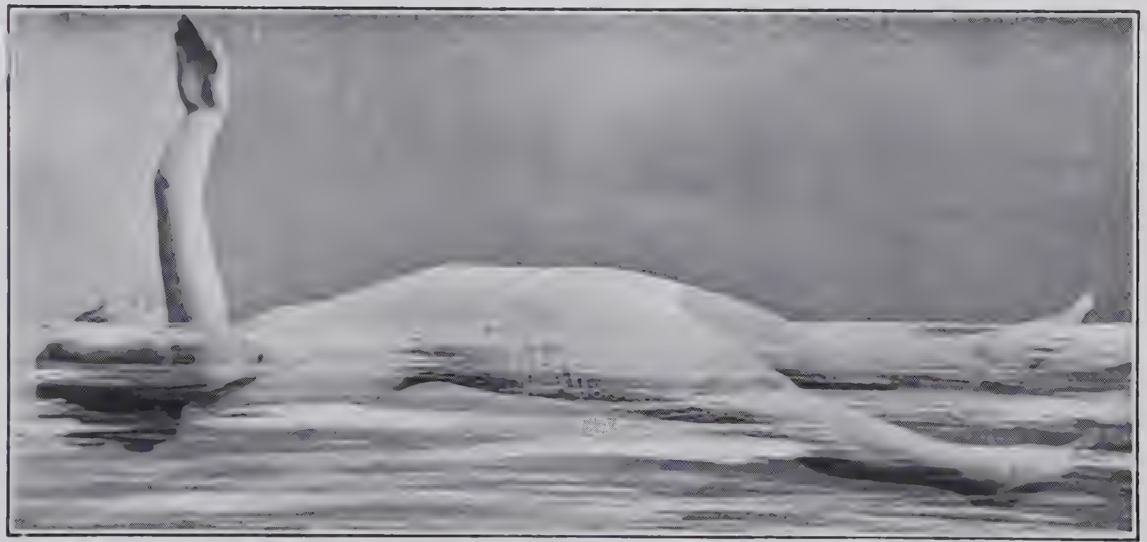
Showing the finish of the right arm drive, with the left arm commencing the drive, and the right arm about to be brought forward. Study the positions carefully.



The dry land practice of the crawl swimming stroke in the horizontal position, showing the same arm action, right arm in the drive, left arm brought forward, elbow first. This also shows the "flutter kick," toes extended. (See next photo.)



Showing the right arm recovering and the left arm driving. This especially shows the turning or side-rolling of the head to catch a quick breath of air. Ordinarily the face is submerged, the head being turned sideways for a quick breath through the open mouth.



This is a new crawl back stroke with which back swimming records are now being made. The "flutter kick" is used as in the ordinary crawl. This shows the recovery of the right arm the arms working alternately. (See next photo.)

in performing the motions are muscle-bound and should go through the exercises day after day for months, if for no other reason than for health's sake, for a bound, tight muscle is a dead muscle, and no one should carry dead tissue on his frame.

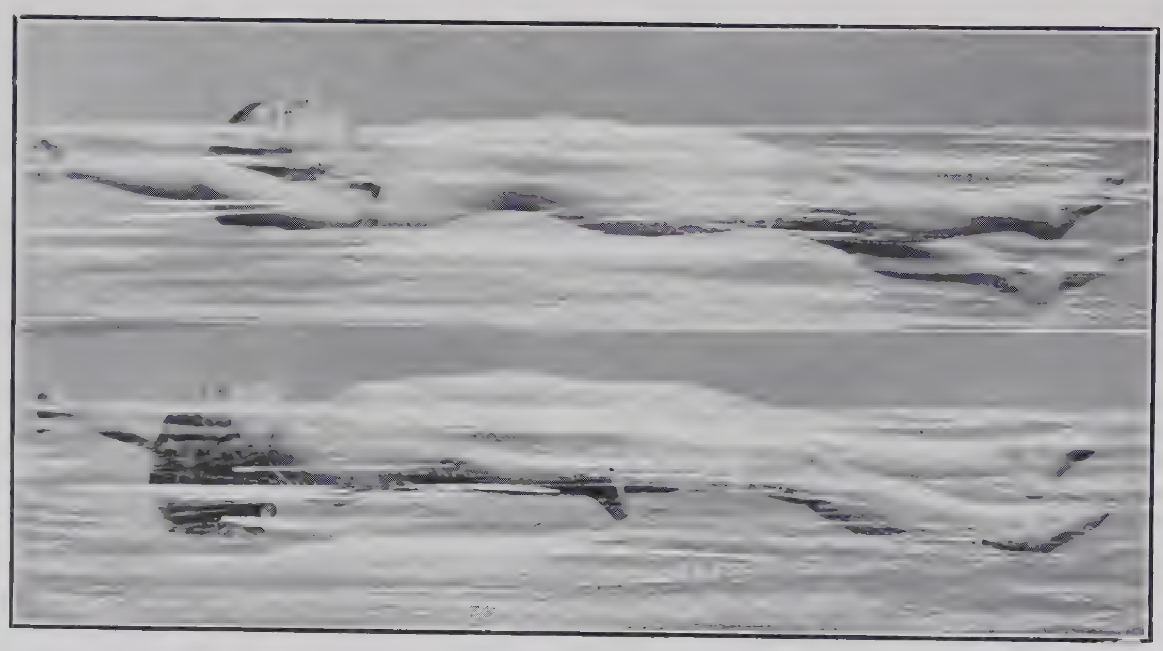
The most valuable all-around stroke is without doubt the trudgeon. It is the stroke to swim long distances with. It is the stroke you play water polo with. It is a speed stroke in which you may hold your head out of the water and observe the surroundings. The racing style of trudgeon only differs from the pleasure style in the fact that while racing you swim with your head and face down in the water all the time, having the body on a perfect horizontal.

The Australian crawl stroke, or flutter kick, when taken in the open air and in pleasant, warm water, is a most healthful exercise for men and women, boys and girls, but is especially advantageous to the half-invalid woman who is suffering from prolapsus or displacement, inasmuch as it is performed not so much by knee action, as stated so frequently, but by the action of the muscles above the pelvis and the upper thick muscles attached to the trunk, such as the psoas magnus or large loin muscle which is attached to the front of the lower part of the spine and the top of the upper leg bone. Also the abdominal muscles are so brought into play that the pelvic organs are not only immensely strengthened but are forced back into their normal position. Some years ago certain French savants made quite a name for themselves by making invalid women run on all fours, such exercise, with the body horizontal, being the only form of exercise which tends to restore the pelvic organs to their normal position. One can readily see how undignified and unpleasant this exercise must have been and how much more interesting and beneficial the Australian crawl stroke is. Again, the flutter kick, as well as the arm work of the crawl, induces very deep breathing. It opens up the bottom of the lungs and gets the stale, tubercular atmosphere out of the lower cells, thus renovating the whole lung cavity.

The scissors kick is one of the main pillars of the art of swimming. The side under-arm, the English over-arm, the Russian style and the trudgeon strokes are all dependent upon a good scissors kick. The trudgeon stroke is a long-distance racing stroke as distinguished from the crawl, which is the sprinting, or short-distance, racing stroke. The scissors kick is much more restful than the flutter or crawl kick, so that it is absolutely imperative for every swimmer to learn to do it correctly. The old-style scissors kick in which the upper leg was thrown out far in advance of the median line is not the style I teach. I have the upper leg almost straight, limping up a little at the knee, with the ankle at full stretch like that of a toe dancer. The ankle of the under foot may or may not move, but the upper ankle must always be kept at full stretch. Should the pupil be right-handed, he should swim with the left side down, the skillful arm being uppermost; if left-handed, with the right side down, also with the skillful arm uppermost. Thus, should he wish later on to play water polo, he will have the skillful arm uppermost with which to throw the ball. At the moment that the ball is thrown, a powerful scissors kick is given. There are other reasons why the upper arm should be the skillful arm, while there is no reason whatever why a person should swim with the right side down in order to protect the heart from a little extra pressure. This is simply imagination. In throwing the water polo ball, the powerful scissors kick raises the player high out of the water and enables a strong over-arm, round-arm or back-hand throwing. Only a cork of a man can throw the ball, while still in the water, more than a very short distance; if he wants to throw it seventy-five feet, the scissors kick is absolutely necessary. The under leg is the main guide when swimming with the scissors kick. It is thrown back, the knees separating from before, backward and never from right to left, and a powerful kick being delivered with the top of the under foot, frequently making a big wave. The scissors kick uses the largest muscles in the body and that explains why it is a restful style of water locomotion. In fact, one can go to sleep in the water and work the trudgeon stroke hour after hour, using the scissors kick, breathing in rhythmically with the kick and out on the drift, swinging both arms over the water alternately so that the kick is given with the pull of the under arm, for in the trudgeon there is a slight lean on one side.

The illustration given shows a rope stretched taut the length of the pool about a foot above the water. The lower hand is placed flat against the wall and thus holds the body out on the horizontal, on the side. The mind is thus enabled to center on this one detail—the scissors kick. In the illustration the pupils are taking their first lesson in the scissors kick and the reader will notice that some are more skillful in assuming the proper position than others. The mistake which most swimmers make in trying to do this kick is that of throwing the upper knee and foot too far forward. The upper leg should be held almost straight and just make a whip-like snap to meet the under leg's strike. The narrow and not the very wide scissors kick is correct.

In conclusion it may be permissible to point out that the benefits of the delightful art of swimming are very far from being generally appreciated, and that the trouble of acquiring it is abundantly worth while, even if one is so unfortunate as to have to do it after having attained adult life. It not only affords a safeguard against dangers which are every summer borne in upon us by an appalling and unnecessary loss of life, but it combines the benefits of physical exercise with the stimulus of cold water in contact with the skin, which is one of the most valuable of all stimulants. The Romans used to speak with contempt of those who had neither letters nor swimming, but in these days we are apparently satisfied with letters alone, for we build our schools without swimming tanks.



The upper position shows the complete recovery of the right arm and beginning of the right arm drive; the lower, the completion of the right arm drive and the beginning of the left arm drive.

LIFE SAVING

By ANNETTE KELLERMANN

FORTY-FOUR per cent of the deaths by drowning are due to the unskilled efforts of one person to help another. These deaths can be avoided by popular education in proper methods in rescuing.

When a cry for help is heard, unless the case is one in which not a second can be spared, one should not attempt to rescue while fully clothed. At least the heavier outer garments and the shoes should be removed. The few seconds required for this will be adequately compensated for in the greater speed the rescuer will be able to make when once in the water.

One should never try to swim up-stream to a drowning person, as valuable time is lost in fighting the current. Running is much faster than swimming, therefore one should run up-stream until he reaches a point well above the person in trouble. He can be throwing off his clothes as he runs.

The victim should always be approached from the rear. He has much less opportunity in this way, if he has become crazed with fear, to clutch his rescuer and drag him down, thus hindering the work of rescue, if not actually causing both to lose their lives. This advice holds good whether the victim seems rational or not; one never can tell what a drowning person may do.

In case it is a question of seconds or one must work in crowded quarters and must approach from the front, the breast stroke should be used, and the victim's wrist should be suddenly grasped by the right hand. Then he can be immediately pulled on his back into a towing position.

If the victim is quiet, he should be spoken to encouragingly, and assured that he is no longer in danger. He must be made to understand the necessity of doing all he can to aid in his own rescue. Once his confidence is gained, the matter of the actual rescue becomes comparatively simple for the experienced swimmer.

If the victim is a tired swimmer needing assistance or suffering from cramp, or even a non-swimmer who knows what to do or is rational enough to follow instructions, the proper method is for the victim to place his hand extended at arm's length on the rescuer's shoulder, and sink his head as far as possible in the water. This position gives the rescuer the fullest use of arms and legs for the breast stroke. This position is, however, exceedingly dangerous to the rescuer if there is any doubt as to the victim's self-control, for from this position he can climb upon the rescuer's back and get a leg-lock around the body, which is one of the most difficult holds to break.

If the victim is not struggling, the rescuer should turn him on his back, taking his head between his hands so his palms cover the ears, and his fingers point toward the top of the victim's head. Then he should lie well back so that both bodies will be in a nearly horizontal position, and swim toward shore, using the frog-kick.

If the victim is struggling frantically, he should be quietly and quickly approached from behind. If possible, let the rescuer grasp him by the arms, pressing the fingers into his biceps. When the arms are pressed sharply back, his legs will come up, and in this position he can be easily controlled if firmly held, and towed ashore by swimming on the back with the frog-kick.

In spite of all precautions, the drowning man may clutch his rescuer, so as to endanger both their lives, and it is necessary, accordingly, to know these clutches and be able to break them. In some of the pictures which illustrate this article, a woman is shown as the rescuer, and a man as the victim to indicate that the weaker person can break the grip of the stronger, if the proper method is known.

When the victim grasps the rescuer by both the wrists, the latter should bend his arms first downward, then outward and upward. The result will be to twist the victim's wrists and put so severe a strain on his thumbs that he will be forced to release his hold. The pain is too severe to be endured, even for a moment.

If the victim grasps the rescuer by one wrist with both his hands, the latter should draw away from him, put his foot against the victim's chest and push. As the legs are much stronger than the arms, it will be readily seen that the hold must break.

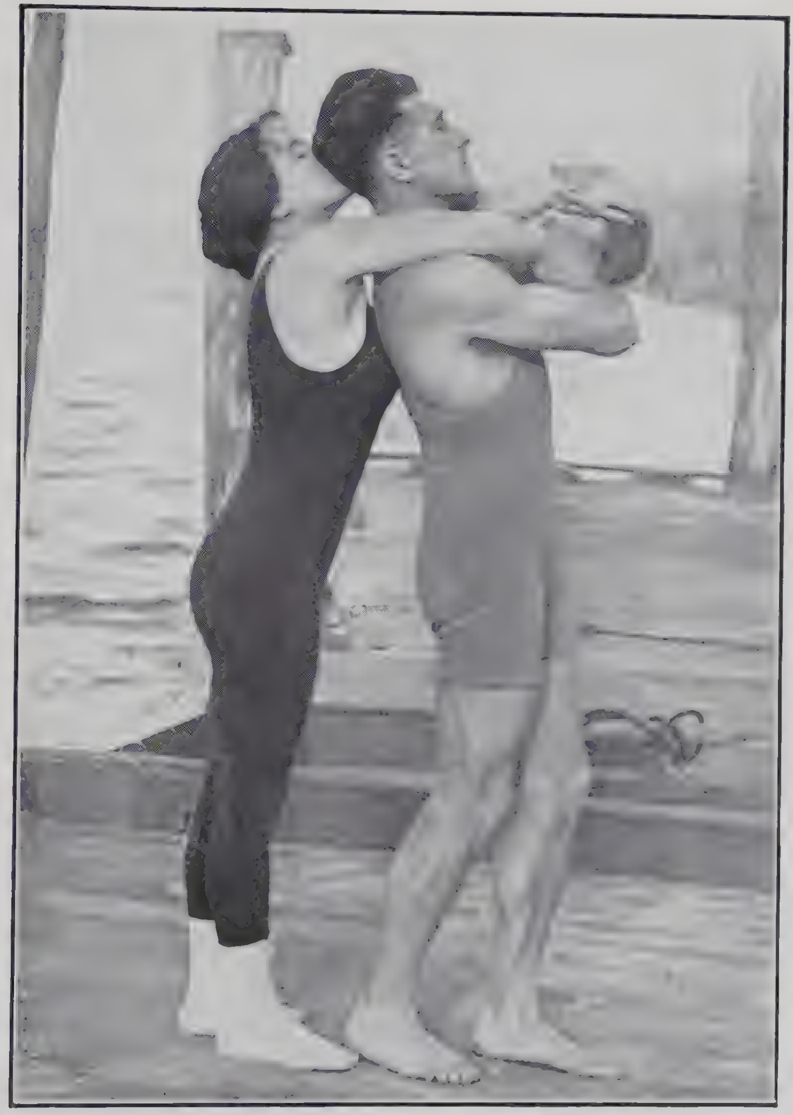
If the victim gets his arms about his rescuer's body from the front, the latter should draw up the knees with a sudden movement, as close as possible to the abdomen, and then kick out straight forward with both feet. This movement will break the strongest body hold as it is leg strength against arm strength. If the rescuer should be gripped in such a manner that he cannot easily get his feet free, he may place his left hand in the small of the victim's back, with the palm of his right on the point of the victim's jaw, and index and middle fingers squeezing his nostrils, then push away with right and hold firmly with left hand. Or he may bend the drowning person's head back by pushing back his forehead and giving him a quick, sharp jolt on the point of the chin with his fist.

It is child's play to slip out of a strangle hold, if one but knows this very simple method. The rescuer first brings his arms upward and outward with a quick jerk until they are on a level with his shoulders. Simultaneously with this movement of the arms, the head is brought forward and downward with a snap, turtle-fashion, and the strangler suddenly finds his arms about nothing but water. It makes no difference how strong he is.

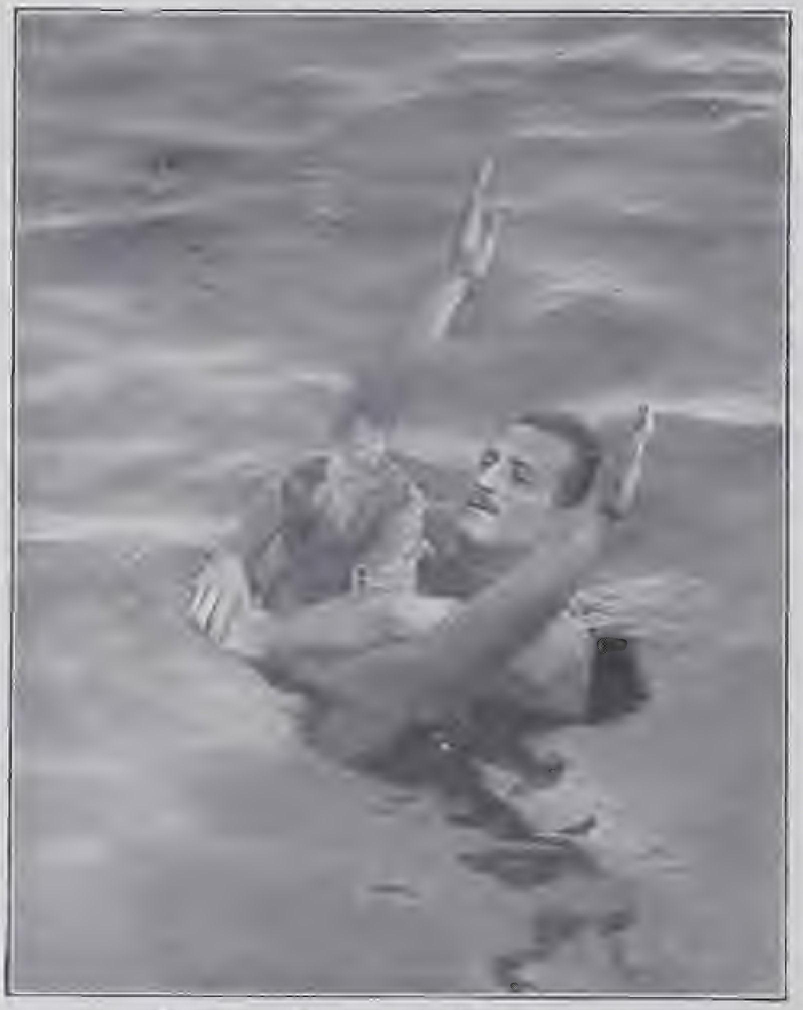
The shoulder hold is one of the most dangerous because the rescuer's arms are pinioned against his sides. To break this hold he must raise his arms above his head. This causes the drowning person's arms to slip about the rescuer's neck, and he can then drop out as from the strangle hold.

The strangle hold from behind is more dangerous because more difficult to break. The rescuer should let his feet sink until his body is in a vertical position, and tread water for a moment to bring both heads well above water. Then after grasping the wrists of the victim, let him drop his head forward as far as possible and then throw it back with all the force he can command. If this blow does not stun the victim, the rescuer should bend back one or two of his fingers until the pain forces him to release his grip.

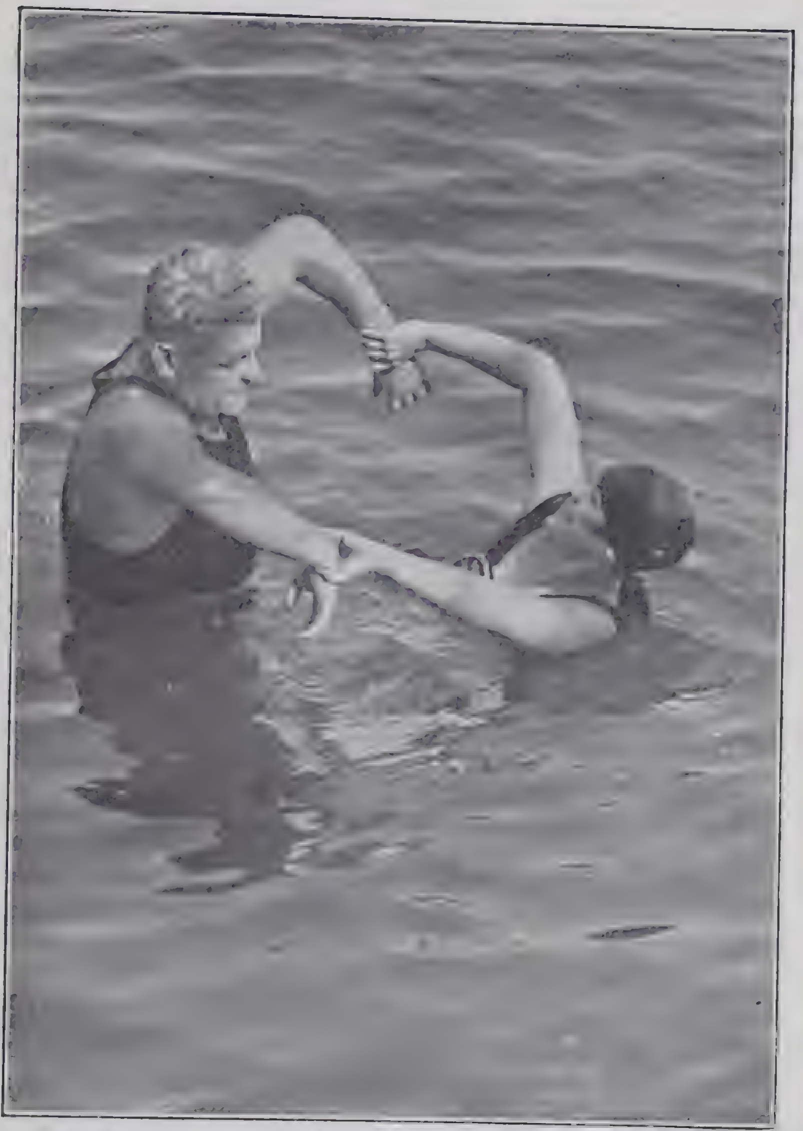
The body hold from behind is perhaps one of the hardest of all the holds to break. If it is an arm hold



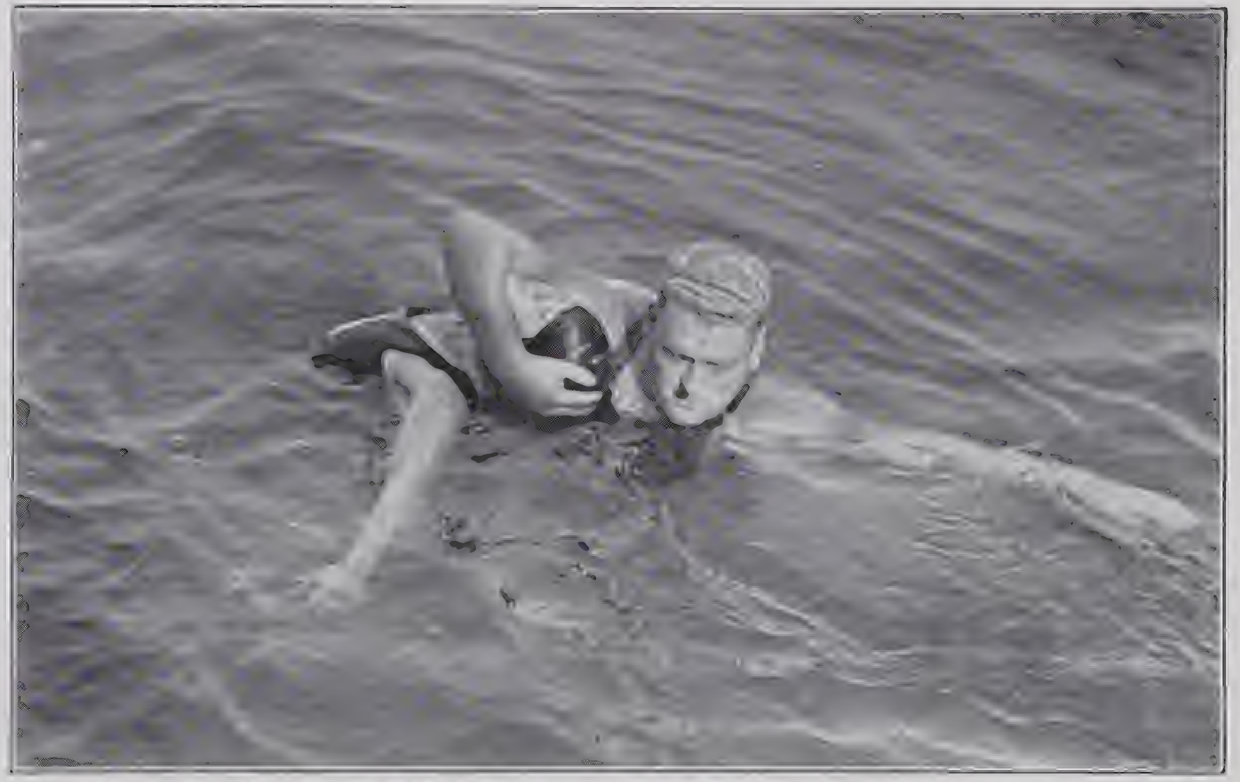
Life-saving sometimes requires strenuous and heroic measures. This photo not only shows how a life-saver frees himself from the frantic strangle hold of a drowning person by the right use of the hands, but also how to use the head to make him or her let go.



When a drowning person seizes his rescuer by or around the shoulders, the hold may be broken in this manner, slipping from under.



This shows a method of breaking a wrist hold, using an outward twisting action. A terrorized drowning person will defeat the life-saver's attempt at rescue unless his or her own grip is broken.



This shows an excellent one-arm hold for life-saving use, the rescuer swimming with the other arm and legs.

only, the rescuer may be able to push the encircling arms downward over his body to the lower abdomen, and proceed shoreward swimming with the breast stroke. The face of the victim, however, will in this position be submerged most of the time, and he will therefore soon be likely to loosen his grip, giving you an opportunity of securing a more satisfactory hold, preferably one of the towing holds.

The body hold from behind with leg grip is the most dangerous of all the holds. The victim tries to climb upon the rescuer's back, forcing the latter beneath the water. The rescuer may free himself by turning and placing one hand over the victim's face and pressing the nostrils tightly, at the same time pushing him away. With the other hand he should grasp one or more of the drowning man's fingers clutching in front of his abdomen, and bend them back. When the pain of his bent fingers becomes too great for the victim to endure, his legs will loosen and the rescuer can kick free. If it is a leg hold around the body where one can reach the victim's foot, the ankle of one foot should be grasped in the left hand, using that hand as a vise, and the foot ground in a circular motion with the right hand.

If the victim is in a state of insane fear, it is useless to try to reason with him, for quick and decisive action, even though it involve a certain measure of violence, is essential. In extreme cases of violent and persistent struggling, when the rescuer knows that he has a hard swim before him, the only thing left to do is to render the victim unconscious. This may be accomplished by a right or left hook to the point of the jaw, or by the solar-plexus blow, delivered just below and a little to the right of the heart. This latter is, however, a little difficult to deliver under the water with the required force.

A variety of methods may be used to tow a drowning person ashore. Probably the most common is to drag the victim along by the hair, swimming either on the side with the single under-arm stroke, or on the back, sculling with one hand, and using the feet in the ordinary frog-kick. The rescuer can also swim face downward, using the breast stroke with his free hand. This method is very slow, however, as the body of the subject trails behind and interferes with the effective use of the swimmer's feet. Moreover, if the victim's face is not kept above water, he may be drowned while being rescued.

This last risk may be avoided if the victim is a woman by passing her hair between the teeth. The victim's head then rests face upward against the back of the rescuer's shoulder and is well out of water. It is of the utmost importance to keep the face of the drowning person above water, even though the rescuer's becomes immersed part of the time, as the victim cannot control his breathing as can the swimmer. A steady stroke should be used in swimming and all jerking and tugging avoided.

When the swimmer is strong enough to execute it by far the safest way of carrying a drowning person is to place the chin of the victim in the hollow of the elbow while the head is grasped in the same hand. In this position the drowning person is on his back and cannot interfere with the work of the rescue. But the chief advantage of the position is that the person "carried" in this manner has his face well out of water.

TEACH YOUR CHILD ARTIFICIAL RESPIRATION

By RICHARD P. KELLY
Supervisor of Physical Training, Tacoma, Wash.,
Public Schools

"HONEST injun, teacher, would you be willing to have any one of your pupils, the only one pressent, to try what could be done for you if *you* were taken out of the water apparently drowned?" I say "any one" for fate will not necessarily pick your brightest pupil to uphold your reputation as a teacher when an emergency comes. Oh, yes, perhaps you have read in a book and discussed what to do in a drowning emergency. But when the time comes the pupil who will be sure to do all that can humanly be done will be one who has actually performed the operation on a living schoolmate, brother, sister or friend.

There is nothing new in this lesson. All the information it contains can be found in any modern school hygiene or manual of first aid. The Schaeffer or prone pressure operation for resuscitation in cases of drowning, gas asphyxiation, or electric shock can be taught to any boy or girl ten years of age or older by any parent or teacher, however inexperienced, who will take the trouble to study the operation and the time to teach it. Probably nine mothers or fathers in ten who read this page will find by inquiry that their children have not been taught this method in school, and nine teachers in ten will have to admit that they have not taught it as a matter on which life may depend should be taught.

What I propose is that every mother or father who reads this page ask his boys or girls tonight if they have ever actually practiced this operation. If they say they have, reinforce the work of their teacher, who must have been a good one, by having them demonstrate it to you, checking their procedure in all essential details.

If the boy says he "knows how," but has never actually "done it"—don't accept book learning in this case unless you would be willing to have a theoretical operator stand between *you* and death—let him take this chapter for the teacher to read, and ask her if his class or school cannot have this kind of a lesson.

Teacher, I hope you have seen this first. Tomorrow is the day for the lesson if it doesn't rain. You want one day to look the explanation over and if possible practice the operation on a pupil or friend. And meanwhile you want your pupils to ask at home what father and mother know about resuscitation. Hygiene isn't taught as it should be unless you have the homes interested in what you are teaching and helping you teach, for hygiene isn't knowing, it is living and doing.

When the pupils come back tomorrow with their information, I hope the first one you ask may be one who knows the Schaeffer or prone pressure method of "what to do." If not, you may hear a lot about lifting the patient to "get the water out," "working the arms," drawing out the tongue, wiping the mouth, and many other details. All of these things used to be done, but they take too long, and there are too many of them, and the operator, especially an inexperienced one, is likely to forget some essential details which will make the whole operation ineffective. Tell the pupils that a

Doctor Schaeffer of Edinburgh was commissioned by the British government to find the best method of all, and that he found one which was not only the most effective but the simplest and easiest. This method has since been adopted by our army and navy, by the Red Cross societies of many countries, and is the one taught in all modern public schools. To avoid confusion in the minds of pupils no other method should be taught to them, at least before they have finished high school.

In Tacoma we now plan to have pupils in all grades from the fourth up actually practice this operation at least once a year. And after every such lesson every pupil is advised to practice the resuscitation on a brother or sister or friend at home, in the presence of the parents, so that they will know that he knows it and, incidentally, so that the parents themselves will know it. After our lesson last spring many of the pupils reported that their fathers and mothers had actually got down on their knees and practiced too. Why not? It is worth something to be sure, isn't it, mother? And when your boy sees that you think it is worth while he is not going to fail when the time comes, is he?

I believe that two dates annually should be set aside in every school when this lesson is repeated, only as the years go by the teaching should all be done by the older pupils of the school, who know the operation so well and believe so thoroughly in the value of knowing it that they will insist upon the lesson being given and see that it is correctly given even if a new teacher has come to the school. The reason for having fixed dates every year is that what may be done any time is sometimes never done; the reason for repeating the lesson from year to year is that it cannot be too well known and that there will probably be pupils present each time to whom the operation is new. In the Tacoma schools the lesson is given to all the pupils from the fourth grade up through the high school the first week in October and the first week in May. In October the memory of the summer experiences near the water is still fresh in the pupils' minds; the May lesson is in time to anticipate the first drowning accidents of the summer to follow. Do not omit the lesson because there is no water for swimming near your school. Your pupils will not live all their lives in an inland district.

The operation, which can be easily understood by a reference to the illustrations, is performed as follows: To start respiration, lay the patient face down on a level place. Turn the head to one side and rest the cheek or temple on the back of the wrist so the mouth and nostrils will be out of the dirt. If there is a breeze blowing turn the face in that direction, but that is not essential. Kneel beside the patient below the waist, or better kneel astride of the legs between the hips and the knees. Place your hands on the small of the patient's back in such a way that the thumbs are extended across the back toward the backbone, and the fingers are spread over the sides near the lower ribs.

It is because the correct placing of the hands is so essential to the most effective performance of the operation that practice upon a living person is necessary. The teacher should examine carefully to see that all the pupils have their hands correctly placed.

Begin. Swing your weight forward with a gradually increasing pressure, until you are pressing with the thumbs and squeezing with the fingers as much as possible. Count five slowly during this operation. Now straighten up quickly, releasing the pressure suddenly, but without removing the hands from their position on the back, and count five while the pressure is released. Repeat this from ten to fifteen times a minute, without pausing between the movements, until help comes, *or for at the very least one hour.* Persons have been restored after several hours of artificial respiration, and after they have been in the water some time.

The foregoing is the essential part of the process. Note how simple it is. Yet hundreds of lives are lost every year because people who might easily have given the resuscitation successfully had never heard of it, or did not dare to attempt it because they had never practiced it.

Begin the artificial respiration as soon as possible after an accident. Every second counts. Do not wait to get the patient too far from the water; do not wait to remove the clothing, or for anything else. If you are the only person present and you have to choose between performing the operation yourself or going for help, by all means use the operation. If there are others present besides the operator, a doctor should be sent for.

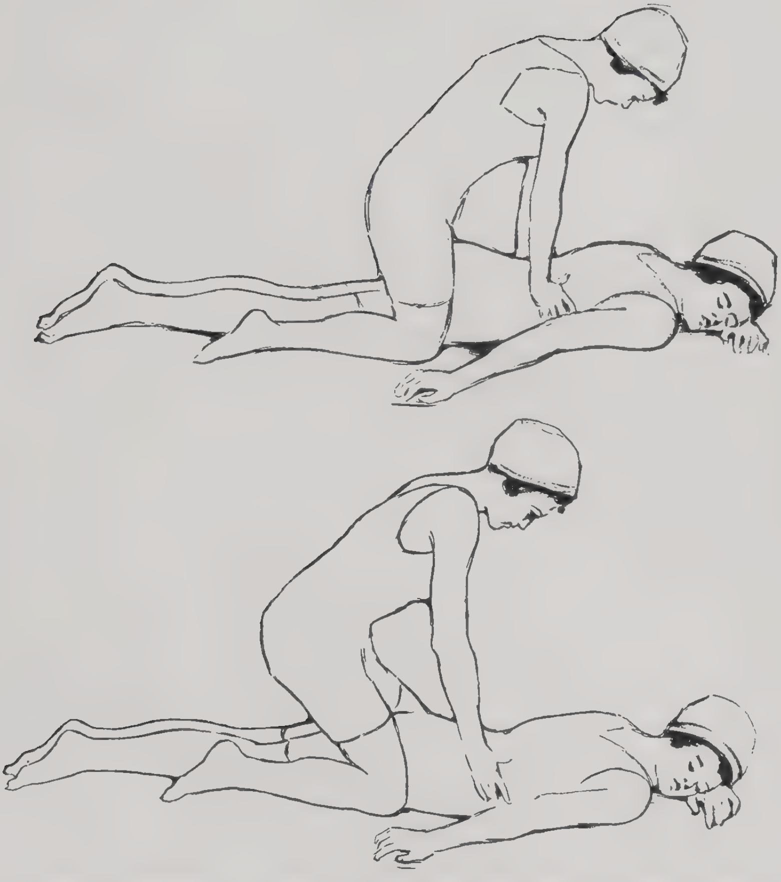
The first thing needed in the case of asphyxiation or shock is to start the breathing, which at the same time starts the heart action. The next is to restore the normal warmth of the body. While one person is working for the respiration, others if present can be wrapping the patient in blankets or coats, applying hot water bottles to the feet, and rubbing the arms and legs vigorously toward the heart. Teachers, see that your pupils explain to you why they should rub *toward* the heart. It gives you one of the best opportunities you will ever have to teach about the venous circulation. In case of an accident away from civilization, large stones can be heated in a fire, wrapped in cloth or paper so they will not burn the skin, and applied to the arms and legs. If conditions are such that you can have your pupils build a fire and prepare and use the stones or bricks, they will never after forget that warmth is valuable in cases of shock.

It is not believed advisable to instruct grades one to three in the operation, but it will be of value for them to know it, and it is suggested that they be allowed to watch the lesson and told to tell their parents about it. In many schools the semi-annual lesson is made an event to which the parents are invited.

When the pupils are taken out for the lesson, they march in twos until they have reached the proper place, when number one gets down on the ground and number two acts as operator, and when all of the number twos have performed the operation to the satisfaction of the instructor the partners exchange places. This is an essential detail. Every pupil should perform the operation, and every pupil should have the feeling of the pressure and its effect upon his breathing.

As in the conduct of a fire drill, the pupils should first be made to feel that this is something which may sometime be a matter of life and death, and that they should keep their minds in a serious and receptive attitude.

Teachers, if your textbook in hygiene proposes any other method, amend it by substituting this.



Artificial respiration. Place the victim on their stomach, face turned to one side, upper head on forearm to allow water to drain from the mouth. Placing hands on the back just above the waistline, alternately lean forward, pressing the air out of the lungs, then lean back, relaxing pressure. Continue in this way, allowing three seconds to each movement, or twenty inhalations per minute.

Parents, if this resuscitation is not taught in your school, you can teach it in the home. It may never be needed. But it can be taught in fifteen minutes. And a result of this fifteen-minute lesson mav be a useful life saved.

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